INDIA RUBBER WORLD
FOUNDED 1889
CAOUTCHOUC
GUTTA-PERCHA
Reg. U.S. Pat. Off.
Reg. United Kingdom.

Published on the 1st of each month by

THE INDIA RUBBER PUBLISHING CO.
No. 25 West 45th Street, New York

Telephone—Bryant 2576

CABLE ADDRESS: IRWORLD, NEW YORK

Member of the National Publishers' Association

HENRY C. PEARSON, F.R.G.S., Editor

Vol. 67 JANUARY 1, 1923 No. 4

SUBSCRIPTION: $3.00 per year, $1.75 for six months, postpaid, for the United States and dependencies and Mexico. To the Dominion of Canada and all other countries, $3.50 (or equivalent funds) per year, postpaid.

ADVERTISING: Rates will be made on application.

REMITTANCES: Should always be made by bank draft, Post Office or Express Money Order on New York, payable to THE INDIA RUBBER PUBLISHING COMPANY. Remittances for foreign subscriptions should be sent by International Postal Order, payable as above.

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For Nineteen Hundred Twenty-Three!

TO the World's Rubber Industry:—Planter, Manufacturer, Distributer, and to all related Industries, we wish a Happy and Prosperous New Year.

Will Benefit American Rubber and Cotton

THE opening of the West Indian Agricultural College at Trinidad, British West Indies, is an event of the greatest importance to those whose interests center about rubber or cotton, or both. The final establishment of the university crowns the efforts of Sir Francis Watts who for so many years as Commissioner of the Imperial Department of Agriculture, labored for it. Accepting the position of principal he has organized a brilliant professorial staff comprising men eminent in all the important departments of tropical agriculture. Sir Francis Watts, once a pupil of the great Faraday, possessed of a profound knowledge of all tropical products, notably rubber and cotton, with his staff brings to the Americas just the sort of scientific assistance that has been so profitable to Ceylon and the Malay States.

Rubber Latex to the Front

No industry in the world is as interesting in its varied and unexpected phases as that of rubber. Established rules are constantly upset and the impossible frequently accomplished. This gives to the industry a fascination that is constantly stimulated and affords infinite zest to the creative and imaginative mind.

One of the newest and decidedly promising developments is the commercial use of rubber latex. Public attention was first drawn to it through Professor Kaye's latex paper. A study of the patent office files, however, makes it plain that many other chemists and physicists had long been experimenting with rubber milk. Taken as a whole the most remarkable discoveries seem to have been made in the laboratories of the General Rubber Co. at their plantation in Sumatra, working in conjunction with those of the United States Rubber Co. in New York.

For months past we have chronicled progress in the use of rubber latex. In this issue even more interesting developments are described, and it is safe to say that this is only prefatory to what will follow. Latex from native sources, from dispersed crude rubber, from vulcanized waste—surely next will come synthetic latex.

Increased Rubber Pavement Interest

THE Cenotaph, London's beautiful tribute to her heroic dead, stands where the noise of traffic of one of the busiest cities in the world is constant day and night. H. Greville Montgomery, editor and proprietor of *The Rubber Age*, London, is arousing English sentiment to do away with this turmoil. His plea is for rubber paving of the streets leading up to the monument. The establishment of a zone of silence that in contrast to the city's clamor outside should give one pause and be a reverent tribute to the honored dead. The thought is a wonderful one, dignified and thoroughly practical.

The British interest in rubber pavements brings it home to Americans that we are behind the times as far as rubber roadways go. Although England is the leader, other European countries also possess them. Two of the leading British rubber manufacturers have long been equipped to lay them. In the United States, however, even in the "Rubber City," are no rubber roadways.

The beginning of a great American interest in this subject is, however, indicated. His Honor, Mayor Curley of Boston, appeals to THE INDIA RUBBER WORLD to inform him what American companies are prepared to lay down rubber pavements around the Boston city hospitals.

If the streets in front of hospitals, schools, and churches, were rubber paved much would be accomplished. This would doubtless be followed by silent streets about the great hotels, in front of city residences, and in time before office buildings. Thus would rubber, the great silencer, soothe the sick, aid the reverent, and poultice the sound-shocked nerves of teacher, pupil and worker.

Size Saving Adds to Capital

THAT even a moderate advance in the direction of general standardization of manufactures would in a single year release more capital for productive needs than is deposited in the same period in all the savings banks in the country is the calculation of one of the largest financial institutions in New York.

It is not hard to understand how this could happen. Manufacturers would not have to tie up funds in goods that might lie a long time in warehouses, and dealers would not have to invest in slow-moving stock. Making and vending only staple, standardized goods, the capital of each class would be turned over oftener and thus offset loss occasioned by discontinuing the making and handling of an almost limitless variety of virtually similar goods.

There need be no anxiety about enterprise being dulled or inventive genius discouraged by cutting out numerous non-essentials. American ingenuity will take care of that.

Before America took a hand in the great conflict about four dozen different sizes of passenger automobile tires were made in this country, and without good reason. "Eliminate the unnecessary," suddenly insisted the Government, "and conserve labor and materials"; and forthwith tire manufacturers cut the list of such sizes down to scarcely a dozen. Has anyone since regretted the sweeping change? Who shall say that the list could not be still further reduced without putting buyers to any real inconvenience, while inuring largely to the advantage of makers and dealers?

What is said of tires applies with equal pertinence to all rubber goods. "There is more profit and steadier trade in making a few staple articles, and in making them well," said the maker of the most popular motor car, "than in making a great variety of articles for the few or to meet a wavering demand."

Education is needed in this as in many another reform movement. The public must be shown how it will benefit positively by standardization before it will actively cooperate. So, too, if results are desired, action must take the place of discussion. A great many realize that in the abstract the proposition abounds in merit, and they would like to see something done, but they hesitate about taking the initiative. Where the advantages are so obvious, the one course that commends itself is to begin.

Rubber Mixing in Lead Works

THE truth of the observation of the Bard of Avon that "Sweet are the uses of adversity," is oddly impressed on British rubber manufacturers. Confronted with the new and exacting "India Rubber Regulations," many of them foresaw only a reduction in profits and an increase in official intermeddling. Vulcanizing by means of carbon bisulphide, sulphur chloride, carbon chlorine compounds, or benzol, as well as any process using lead or its compounds (especially powdered) had been certified as harmful to workers. Then, too, the new regulations require special protection against the fumes of toxic volatile solvents, provide for minimum age and shorter working periods, forbid the use of any of the vapor processes in open air, insist upon ample ventilation, regular medical examination, maintenance of a health register, and strictly limit the reemployment of workers with health impaired in a rubber mill.

With most of the requirements for promoting the health of workers the rubber manufacturers expressed themselves as in hearty accord, but many were dismayed at the prospect of having to install expensive devices for overcoming the menace of dry or pulverized litharge, white lead, red lead, or basic lead sulphate as used on mixing rolls. Yet seemingly there is no ill but has its remedy or at least some fair compensation. Just as the outlook was gloomiest, especially for the smaller manufacturers, makers of lead products hove in sight with a remedy—rubber mixed in their factories with the lead base accelerators or compounding ingredients in suitable proportion and with guaranty as to quality.

It is said that for most purposes the rubber mixes made in the lead factories are very satisfactory. The rubber-lead mix can be readily manipulated with various fillers, pigments, etc.; a remarkably uniform product is secured; a saving in time and labor is claimed, too; government sanitary control is obviated; and, best of all, the health of workers in small shops is thus safeguarded almost as well as in the greatest and most up-to-date rubber mills.

RUBBER BANDS, HAVING BEEN FOUND HANDY FOR almost everything else, are now utilized by an expert in "zone therapy" for the relief of pain. If one has a toothache, there is no need to fill the mouth with creosote or to slug the nervous system with coal tar analgetics. Just slip a rubber band over a finger joint and, presto, the pang departs. So, too, a tight elastic band on the big toe will deaden the pain in a mashed thumb. A graphic chart indicates many curious possibilities of this new healing art. If zealous propagandists would bring this to the attention of all who possess fingers and toes, a definite increase in the use of bands and crude rubber would result.

Rubber Pavement the World Over—I

A Record of Rubber Roadways in Great Britain, France, Germany, Denmark, Ceylon, the Federated Malay States, the United States, and Brazil—Patented Compounds—Slabs, Blocks and Bricks—Costs and Tests

WILL the dream of noise-distressed city dwellers for smooth, quiet, comfortable highways with rubberized surfaces ever be realized? Is rubber pavement practicable? Where, in what form, and under what conditions has it been tried? How does it compare in cost, in upkeep and in durability with what are known as standard pavements? How does it rank with the more familiar types of pavement in smoothness, cleanliness, and in sanitary qualities; as also in ease and convenience of repair?

What advantage is to be gained by making roadways more resilient, especially in view of the fact that pneumatic and solid rubber tires, the equivalent in a sense of fair roads everywhere, are now so universally used, and which, coupled with shock absorbers and improved spring suspension, apparently cushion the load of vehicles satisfactorily? Would rubber pavements be an advantage or the reverse to users of rubber-tired wheels; in other words, would the traction of such wheels on a rubber-coated road be retarded or accelerated?

Rubber Paving in Borough High Street, Southwark, England

Rubber matting and tiling have long been used for floors in hotels, banks, churches, theatres, libraries, hospitals, restaurants, stock exchanges, railroad stations, stores and offices, steamships, railway coaches, skating rinks, tennis and other courts, as well as the floors of stables and slaughterhouses; and, noting the many benefits such as silence, safety, neatness, cleanliness, and general comfort, wonder has often been expressed at rubber not being generally used also as a road surfacing material. That it is very durable as a floor coating is well known. As an instance of its lasting quality it is stated that after twenty years' wear the rubber floor in one of London's busiest banks showed practically no wear; in fact, the rubber at the end of that long period was found standing above the stone where the two materials abutted and had to be cut down to restore the floor level.

Such tests give many people the impression that even if the initial cost of a rubber pavement were comparatively high its laying would be justified by the long service it would give. Others, however, contend that the high initial cost will long bar rubber from use as a pavement, and that it is quite dispensable since rubber tires, rubber heels, and rubber soles virtually enable their users to carry rubber pavement about with them. At any rate rubber pavement has unique advantages as it also presents problems not met with in the use or manufacture of tires, shoe treads, or even tiling.

For an adequate answer to the questions aforementioned there is eager inquiry not only among the denizens of noisy towns, but among planters, exporters, and manufacturers of rubber, by users of all kinds of vehicles with all sorts of tires, and by road and sanitary engineers everywhere. To gain a fair understanding of the problems involved as well as to better forecast the probabilities in rubber paving it would be well to review the experiments that have been made and those projected in rubber-surfacing in the immediate future.

British Pioneer Work

The original work and the most extensive experimenting in rubber paving has been done in England where William Freeman as early as 1843 obtained a patent for a compound for paving blocks in which india rubber was an important ingredient. With the aid of heat the rubber was mixed in an iron cylinder with sawdust, sand, or finely crushed stone and pressed into blocks about the size of bricks. These were joined on a smooth, hard surface with rubber cement. Little has been recorded, however, as to the practical working out of this early experiment as well as of several similar ones in the middle of the nineteenth century.

Margaret H. Marshall got an English patent in 1843 for a composition she named "Intonaco," intended, among other uses, for tessellated pavement. The mixture was of vegetable gluten, albumin, oil, "indian rubber," and sulphate of lime.

E. E. Cassell in 1844 patented in England a paving compound of chalk, mineral tar, melted rosin, liquid caoutchouc, and sulphur.

Sir John Scott in 1851 got an English patent on a paving composition of "metallic substances, mixed with coarse gravel or similar materials, bituminous compounds, and cements."

Charles Haichois in 1856 patented in England a process for paving with a compound consisting of lime, sand, asphalt, caoutchouc, gutta percha, marine glue, and wood.

A formula for rubber paving composition published in England half a century ago gave these ingredients and quantities: Caoutchouc 10 pounds, ground stone 85 pounds, sulphur 7 pounds. Another formula was: India rubber melted with pitch and allowed to cool, then pulverized and heated with sawdust, coal ashes, powdered granite, or preferably fossil ironstone; and applied hot to a roadway.

The earliest actual laying of rubber paving is said to have been done by Charles Macintosh & Co., Ltd., Manchester, in the courtyard of the Admiralty in the early '40s. A "hardening process" was employed, believed to be similar in effect to vulcanizing. A dozen years later the work was referred to as a "relic."

The Admiralty courtyard job is again alluded to in Chambers' Edinburgh "Journal," August 17, 1844, which also mentions the paving with rubber of the stables at the Woolwich dockyard, where, after two years' use, the "elastic pavement" was praised for the comfort and safety it gave horses, as well as for its sanitary advantages; and it was stated that a similar pavement had been laid in the carriage entrance court to Windsor Castle, "where it had given much satisfaction." "The Elastic Pavement Com-

pany have lately erected machinery for the preparation of the material for these important purposes, and can produce it, it seems, at a price sufficiently moderate to admit of its general adoption."

Later Rubber Paving in England

When in 1876 so much objection had been made by guests on the first story of the hotel at St. Pancras Station, London, to the noise and tremor caused by passing vehicles, the Midland Railway Company contracted with Charles Macintosh & Co., Ltd., to lay large sheets or slabs of rubber on the arrival side of the station, much to the relief not only of the hotel guests but to the railway patrons as well. The paving proved so satisfactory that a few years afterward the Macintosh firm was given an order to pave also the roadway to the booking offices. A striking proof of the durability of the rubber paving was the fact that, although it had been subjected to extremely hard use by heavy, horse-hauled trucks, it did not require renewal for thirty years afterwards. An examination thirteen years after laying showed but little wear in the rubber pavement, although the wood and asphalt pavements at either side of the road had been renewed many times in the meanwhile.

A rubber pavement similar to that put down at St. Pancras Station was laid in 1881 by the Macintosh company for the London and Northwestern Railway on the roadway under its hotel at Euston Station, London, at a cost given as $32.70 a square yard, of which $5.60 was for each square yard of concrete foundation. For easy removal in street repairs it was laid in slabs or sheets 12 by 4 feet, 2 inches thick, and 17 cubic inches to the pound, on a concrete foundation with 3-inch planks, and the pavement edges were held down with strips of wood or iron. An observer's comment eight years later was: "Imperceptible wear despite very hard traffic; horses do not slip and maim themselves; and if folks fear being run over on account of the lack of clatter from the feet of horses, the latter can be equipped with bells."

Twenty-two years after being laid, some replacement of the pavement was made on one side of the station, the other side being reported as in excellent condition. The new pavement was described as of hydraulic-pressed rubber laid in granolithic cement on concrete. The greatest wear shown was 1⅜ inches and the least 1 inch. The new rubber was supplied by the India Rubber, Gutta Percha & Telegraph Works, Ltd., at $27.09 a square yard, the total cost of laying being $28.75, after allowing for the old rubber. The yearly cost of examination and maintenance of the old pavement was said to be less than 6½ cents a square yard.

In 1900 the courtyard of Claridge's Hotel, London, was paved with rubber by the North British Rubber Co., and in 1913, when relaying some slabs that had not been securely fastened originally, it was found that the wear on the rubber pavement was negligible.

The courtyard of the Savoy Hotel, London, was paved in 1904 with rubber according to the St. Pancras Hotel specifications, by the Macintosh company at a cost of $9,733 when crude rubber sold at from 4*s.* 6*d.* to 5*s.* a pound. The area of the courtyard is 3,750 feet, of which 2,195 were covered with rubber 2 inches thick and weighing 15¼ pounds to the square foot. The cost a square yard, not including the concrete foundation, was $40.78. After ten years' wear the pavement was reported in very good condition, although some of the slabs needed refitting. Some places, too, had been subjected to unusually severe wear due to the stopping and restarting of vehicles, especially those with studded tires; and oil dropping from motor cars had also weakened certain spots. Twenty-one years later the wear was found to vary from ⅝ to 1¼ inches. An estimate in 1908 gave the probable cost of a 60-foot rubber pavement a mile long as £318,000.

Rubber pavement of similar quality to that put down at the Savoy Hotel was laid in Wellington Court, 42, Albert Gate, Knightsbridge, London, in 1895. After giving good service it was renewed in 1902 on the incoming road at a cost of £5 18*s.* 2*d.* a square yard, allowing for the old rubber.

Recent British Rubber Paving

While gratified with the efficiency and durability of rubber paving at the stations and hotels named, the British experimenters were still anxious to make a good test on an unsheltered road, and where traffic would be as severe as climatic changes. Hence in 1913, at the junction of the New and Old Kent Roads, one of London's most crowded corners, a section was laid with rubber-capped wood blocks patented by M. M. Dessau, and for which a gold medal had been awarded to the inventor by the Rubber Growers' Association. These blocks were of jarrah wood—a very hard Australian eucalyptus—into the upper surface of which the ½-inch rubber caps were dovetailed. The caps afforded not only a resilient surface but kept the wood dry. They were grouted in asphalt and rubber keys placed between the blocks. An advantage sought was easy removal and replacement in making excavations.

After being down 295 days, and carrying an average of 190 tons a square yard for 24 hours, it was found that the rubber had not worn noticeably, whereas an adjacent 4-inch wood block pavement had with similar traffic lost half an inch. No case of slip was found, either by horseshoes or tires, despite the fear expressed at the outset that rubber would induce slipping or skidding. The only wear of consequence was on the underside of the rubber cap and the upper end of the wood block. Such wear, it was believed, could be quite obviated with better attachment.

The Southwark Paving

A better attachment was nearly realized late in 1918 in a block invented by George Anderson with a surface 3 by 9 inches and ⅝-inch thick. A half-inch of gray rubber was placed on a layer of vulcanite held closely to a steel plate with circular perforations into which the vulcanite had been set to secure a firm grip. The edges of the steel plate were cut in four places and the strips thus formed were turned down to form lugs which were embedded in thin granolithic cement on top of a concrete foundation. A trial of the plate-topped blocks was made in a section of Borough High street, Southwark, London, alongside a tramcar line, and on which was a fast-moving traffic averaging about 240 tons to the square yard. The base was reinforced concrete 3½ inches thick. It was opened for traffic March 16, 1920, and a few months later it was found that 15 per cent of the rubber blocks had separated from their plates. While the rubber had showed surprising resistance to wear, it was decided to try a different form of plate in the hope of overcoming the trouble of separation. The new plate was of expanded metal embedded in the rubber and more lugs were added. One-half of the experiment area was paved with the new blocks. These held the rubber satisfactorily, and when raised showed no deformation. The blocks were made by the Leyland & Birmingham Rubber Co., Ltd., and the work done by Rubber Roadways, Ltd., a corporation registered February, 1915, originally for exploiting the laying of rubber pavements, floorings, etc., under the Dessau patents.

In the Southwark experiment the hopes of the promoters were not realized. The pavements did not hold up well in the long run, and the experiment was abandoned. The reason given for the failure of the pavement to meet expectations was that when the rubber vulcanized on a metal plate was let down into the concrete, the latter never got hard and the traffic shook it to pieces.

The continuation of this article will cover rubber paving experiments that are now pending in different parts of the world, giving details of construction and cost estimates of the various types of rubber pavement.

READY FOR MAILING. "PNEUMATIC TIRES," by HENRY C. PEARSON. An encyclopedia of tire manufacture, repair, rebuilding, machinery and processes.

Far-Reaching Developments with Rubber Latex

Original Coagulation Methods—Spraying Rubber Latex—Ordinary Fabric Rubberizing —The New Latex Fabric

By far the greater portion of rubber used at the present time is obtained from the latex of the *Hevea brasiliensis*, this being the tree from which most of the rubber gathered on the Amazon and its tributaries is obtained, and is also the tree which is most exclusively cultivated in Ceylon, Federated Malay States, Straits Settlements, Sumatra and other parts of the East. Until comparatively recently all the rubber from this latex was coagulated.

Original Coagulation Methods

In Brazil the method consists in collecting the latex from the trees and immediately proceeding with the coagulation which is effected by dipping a paddle in the latex, and then holding the paddle with the adhering layer of latex over the smoke of a fire made of urucuri nuts which give off fumes having astringent properties, thereby coagulating the latex. The paddle is repeatedly and alternately dipped and held over the fire so that a mass of coagulated rubber is built up on it in layer formation.

On the plantations in the East the process of coagulation consists in collecting the latex and immediately proceeding to the coagulation process by adding acetic acid or some similar chemical to the latex and stirring it until a coagulum is formed, which consists of a spongy mass separated out of the latex and having generally the characteristics of curds separated from milk. Another process is to permit the latex to stand in a warm atmosphere which brings about what is called natural coagulation. After the coagulum is formed, whether by the first or second process, it is taken out of the residual fluid and passed through rolls to squeeze out the contained fluid, and is then dried when it is ready for shipment in the form of smoked sheet, crêpe, slab rubber, etc., to the factories manufacturing rubber goods.

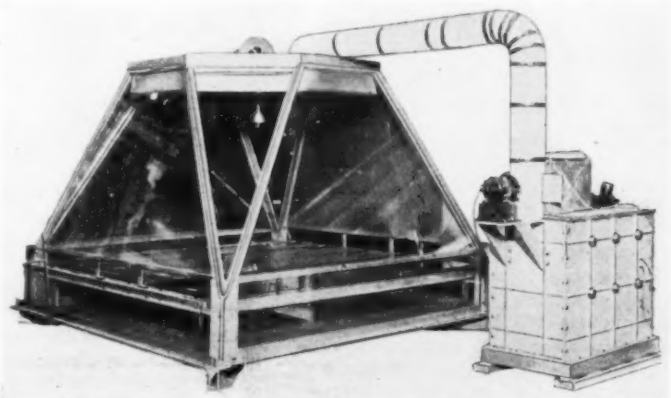
In these processes just recited—in the case of the method employing smoke used in South America and in the case of the acetic acid coagulation—there are contained in the product finally obtained one or more chemical constituents (smoke products, acetic acid, etc.) which are undesirable and, to some extent, injurious. Moreover, some of the contents which are lost in the present methods of manipulation are of importance in the subsequent manipulation and vulcanization of the rubber obtained.

Development of a New Process

With the hope of finding a process which would produce a rubber of improved character and without the disadvantages both in the rubber itself and in the processes of obtaining it, Ernest Hopkinson, vice-president of the United States Rubber Co., undertook the study of latex with the result that a new process is now available which produces a rubber far superior in its characteristics to any produced by the old methods. In studying latex, it was found that not only could the latex as such be used in the production of a new form of rubber but innumerable other uses were found for it. These new processes indicate the increasing use of latex as such and it therefore has also become a problem to develop new methods of handling the latex to the point where it is to be used.

In order to prevent coagulation while the latex is being stored and transported to the point of use, it became essential to find a preservative which would prove satisfactory in all respects. A great many chemicals were tried out but ammonia is the one which to date has given the best satisfaction.

It was over five years ago that the United States Rubber Co. first began to get most encouraging results from its intensive study of latex. From their plantations in Sumatra quantities as small as a pint were first preserved and shipped to the United States. Later on, as confidence was gained in the possibility of transporting the latex, it was shipped in tins, later in drums, and now for some time it has been shipped successfully to the United States in steamers' tanks.



The Hopkinson Latex Spraying Machine

It can be readily imagined that handling the rubber liquid in these quantities has meant changes in the operation on an estate. Today, the latex is transported by tank cars which are filled at the plantations, shipped to the steamer's port of call, there stored and pumped from the storage tank, lighters, or direct from the tank car to the steamer's tank. On arrival at New York the latex is pumped into tank cars alongside the steamer and the tank cars sent to the factory. This is revolutionary in the method of transporting crude rubber and only those familiar with the handling of latex can begin to imagine the difficulties which had to be overcome in perfecting these methods of transport.

While a great many uses have been found for rubber in its liquid form which had not been developed prior to the study undertaken by Mr. Hopkinson and his assistants in the laboratories of the United States Rubber Co., space and the fact that a great many applications for patent are still pending on many of the new uses, lead us to describe here only two of the most important products and processes developed.

Hopkinson Spray Process

The new process which has been developed to produce a superior rubber is known as the Hopkinson spray process. The method broadly consists in flowing the latex onto a rapidly moving surface. In particular, a revolving disk rotating at a high rate of speed is installed at the top center of a heat-insulated chamber about 30 feet high and of the same diameter. The latex is led to the center of this disk and is thrown off, highly atomized, in the form of an umbrella.

Heated air intermingles with the small particles, and dries them

instantly without raising the temperature to a point which would be detrimental to the rubber. The small particles fall like snowflakes onto a conveying apparatus which delivers the rubber in a spongy layer outside the chamber. The heated air is produced by a method which utilizes all of the heat of an oil-burning furnace.

A. COMPRESSED SPRAYED LATEX

B. UNCOMPRESSED SPRAYED LATEX

The products of perfect combustion are diluted with a large amount of fresh air and blown by a ventilating fan to the top of the unit. The air escapes at the bottom carrying with it the moisture from the latex. The process is continuous in operation.

The latex as received in tank cars from the ship is stored in tanks at the factory and from these it is conveyed to the top of the unit where it is led to the spray rotor which atomizes it; the fineness of the atomization being controlled by the speed of the rotation of the electrically driven disk and the degree of moisture being controlled by the amount and temperature of the incoming air.

The apparatus has been perfected to such an extent that the entire operation of the unit, with the exception of handling the finished product, can be taken care of by one man, and practically any desired quality of rubber produced.

One of the chief differences in the character of sprayed crude rubber when compared with ordinary crude rubber appears upon vulcanization. When the material is milled with sulphur a very substantial increase in tensile strength and resistance to abrasion is obtained.

In addition to the production of crude rubber by this method it has been found that compounding and vulcanizing ingredients may with great advantage be introduced into the rubber by spraying them in the same chamber either on the disk which is being used to spray the rubber or by spraying the compounding ingredients separately. In this way the ingredients are combined more easily and in a more homogeneous mass than heretofore secured with crude rubber without the destructive effect of mixing and grinding the rubber and compounding ingredients between hot rolls.

Several of these plants are now in operation or in the course of construction by the United States Rubber Co., both in the United States and the Far East. Considering the superior quality and absolute uniformity of the rubber produced it can readily be seen that it may only be a short time before the entire crude rubber industry is revolutionized.

Rubberized Fabrics

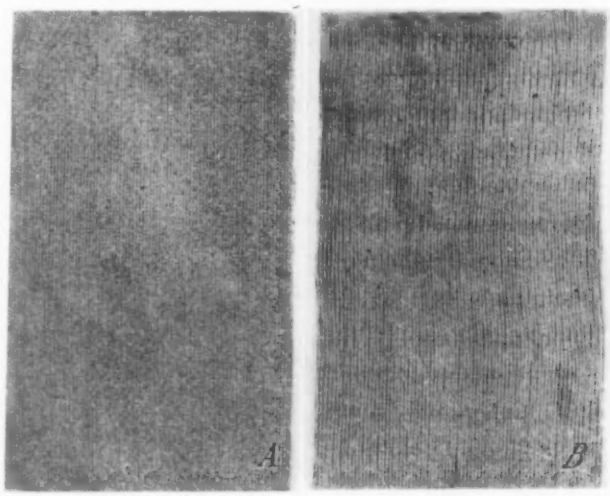
In almost all so-called rubber articles, the strengthening or strain-resisting element consists of fibrous material—chiefly cotton —either in the form of cords or threads, or in the form of knitted or woven fabric. In the ordinary process of preparing these threads or fabrics for use in a rubber article to be subjected to the vulcanizing operation, the threads, cords or woven fabrics are subjected to a process by which rubber is applied to them. In the case of a heavy cord, it has been the practice to feed a core of rubber into the center of the strands or cable in the twisting operation of forming a larger cord. In the case of smaller strands or yarns which are used in what are called "cord" tires, the threads are held in parallel relationship by weak weft threads, and usually rubberized by being immersed in a rubber solution made by dissolving rubber in benzine. The same process is also used in rubberizing square-woven fabric, which is used in tires, boots and shoes, and vulcanized rubber goods generally. After this solutioning process, the fabric is subjected to further rubberizing processes, such as frictioning, in which the solutioned fabric is passed through rolls rotating at different speeds, and warm rubber dough is "frictioned" or rubbed onto the surface of the fabric.

Another process is what is called "skim-coating," in which a sheet of rubber is applied to the surface of the fabric by the fabric being passed through rolls running at even speed, one of the rolls carrying a thin sheet of rubber which adheres to the fabric passing through and is pressed into contact by the rolls. Still another process of rubberizing consists in spreading a mass of rubber made very soft and plastic by a suitable solvent, this plastic mass of rubber being spread over the fabric by a stationary knife or spreading blade as the fabric passes underneath it.

Sometimes all of these processes are used, while in other cases only one or more of the processes referred to are used. The fabric thus rubberized is then cut to suitable size and shape, and associated with crude rubber and built into the form of the article desired, and then subjected to the vulcanizing operation.

Hopkinson's Latex Fabric

It was found that if a thread or yarn is immersed in rubber latex, the rubber penetrates to the very center of the strand. In fact, a microscopic examination of individual cotton fibers



A. LATEX FABRIC

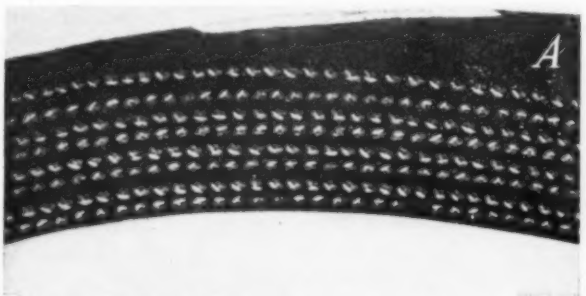
B. CORD FABRIC

so treated shows that the rubber is present in the hollow tubular structure of many of the individual cotton fibers.

Threads or yarns so treated with rubber latex, whether the threads or yarns are individual or are comprised in a knitted or woven fabric, have very great advantages over threads or yarns or woven fabrics treated by the processes heretofore in use, when associated with rubber in the vulcanizing operation. The whole object of rubberizing the fabric prior to its association with crude

rubber compounds is to cause the union of the rubber with the fabric in the vulcanizing operation. When this union is broken, the rubber article rapidly begins to deteriorate. In the case of tires, the breaking of this union is called "separation," and is usually the initial stage of destruction, which progresses rapidly from this point on. With threads or yarn treated with rubber latex, tests have shown that the union lasts very much longer than in the case of threads or yarns treated by the processes heretofore in use.

The latex fabric produced by this new process possesses characteristics which present exceptional resistance to separation of the rubber and cord, thus providing a longer life for tires, belting and other articles manufactured therefrom. These characteristics are due in part to the ability of the rubber to stretch uniformly so that, for example, in a tire the strain from bead to bead is more evenly distributed. The rubberized cords have greater endurance when prepared from latex. Increased penetration of the fibers by latex partially accounts for this increased endurance. It is also due to the fact that the rubber from latex in contact with the cords has not been broken down whereas in preparing cord fabric by the usual methods the rubber is broken down before application.



A. SECTION OF TIRE MADE WITH LATEX FABRIC SHOWING PERFECT THREAD INSULATION AND ALINEMENT

In addition, the latex-treated cords possess an advantage over cement-treated cords in that all of the natural constituents of the rubber are applied to the cords, whereas in cements many of the natural constituents have been lost in the process of manufacture of crude rubber. Further, by virtue of the presence of all the natural constituents it appears that the rubber may be vulcanized more rapidly than rubber applied by cements. The use of latex for coating cords and similar materials as compared with coating by cements, that is solutions of rubber and volatile organic solvents, possesses the advantage that in the case of latex the drying process causes the evaporation of water as compared with the evaporation of naphtha or other solvent employed for making rubber cement. The loss of such solvent entails an increased expense as compared with the loss of water from latex and a similar increase in expense occurs if solvent recovery apparatus is installed.

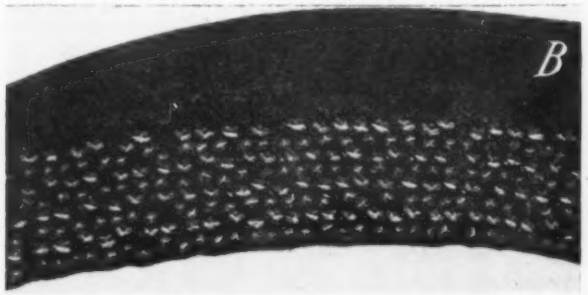
The Hopkinson method for producing fabric is exceedingly simple. A series of cords is led from spools mounted on a creel. The cords, arranged in parallel relationship, are passed through latex contained in a tank. In the tank the latex-treated cords are still in parallel relationship with each other and the latex fabric so formed is wound, after being dried on a series of dry cans, on a wind-up roll when it is ready to be shipped to the factory for use in tires, belting, etc.

These two important developments result in great advantages to both the plantations and the rubber manufacturer. From the plantations viewpoint it means the simplification of the process of converting latex into crude rubber suitable for use by the rubber factory with possible savings over the present cost, and because of an absolute uniformity and high quality which this new process gives.

To the rubber goods manufacturer these developments mean that the end he has so long sought—a pure, clean rubber of absolute uniformity and highest quality—has been attained. By the combined use of this rubber and the latex-treated fabric rubber products can be made of a quality that cannot be surpassed by any product or process now known.

ADVANCE IN MECHANICAL GOODS PRICES

Due to the rising cost of crude rubber, cotton, and other materials, manufacturers of mechanical rubber goods have found it necessary to advance prices. The following companies have already announced an advance of 10 per cent, some organizations stating that unless market conditions improve, their prices may be still further increased: The Boston Woven Hose & Rubber Co.; The New York Belting & Packing Co.; The Manhattan Rubber Manufacturing Co.; The Voorhees Rubber Manufacturing Co.; The Whitehead Bros. Rubber Co.; Hewitt Rubber Co., and the Elkhart Rubber Works. The New York Rubber Co. contemplates an advance of approximately 10 per cent after the first of the year. The Acme Rubber Manufacturing Co., United & Globe Rubber Co.; Quaker City Rubber Co., and the Western Rubber Co., report advances of about 10 per cent.



B. SECTION OF TIRE MADE WITH CORD FABRIC SHOWING IMPERFECT THREAD INSULATION AND ALINEMENT

AMERICAN FORWARD CONTRACTS ASSIST DUTCH RUBBER MARKET

While the forward contracts recently made by American companies with some of the leading producers in the Dutch East Indies do not provide for very remunerative prices for rubber, they have at least provided for sufficient return for the companies concerned to keep them going on living conditions. The concerns affected are among the largest in the Dutch East Indies and are known to include the Anglo-Dutch Plantations Company of Java, the Rubber Culture Company "Amsterdam," the Netherlands Rubber Co., the Padang Rubber Co., and the Hessa Rubber Co.

The contracts have been made on a sliding scale in which the London monthly average price for first standard smoked sheet is taken as a basis, the minimum price being 8*d.* per pound, while the maximum price is 1*s.* 4*d.* per pound. One provision is that the buyers reserve the right to receive their purchases in latex form.

FRENCH DUNLOP RUBBER CO.

The new Dunlop factory has started operations at Montluçon, Allier, France. The factory was purchased nearly four years ago to take the place of the original Paris factory, according to *The India-Rubber Journal*. It is stated that 5,000 workmen are employed, and that there are accommodations for 700 families.

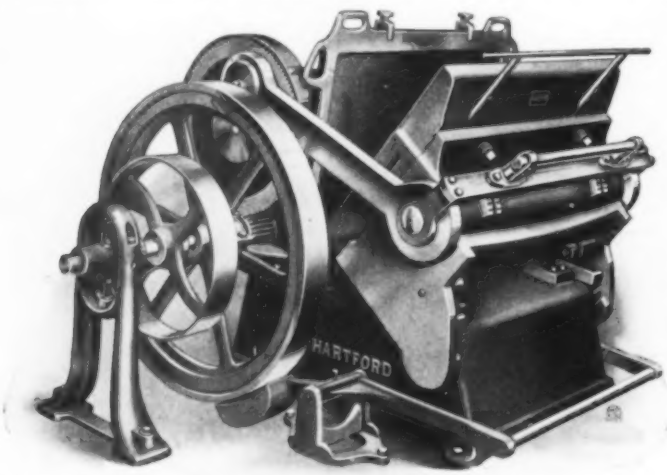
READY FOR MAILING. "PNEUMATIC TIRES," BY HENRY C. PEARSON. An encyclopedia of tire manufacture, repair, rebuilding, machinery and processes.

Paper Box Making in the Rubber Industry

How Shoe Cartons Are Made—Special Boxes for Tubes, Heels and Druggists' Sundries—Cost of Manufacture

Necessity of Suitable Containers

DURING the past few years many rubber manufacturers have undertaken to supply their own accessories by entering other fields such as spinning and weaving fabrics, gumming, cutting, and dyeing fabrics, making lasts, and kindred lines. Some entered these side lines through necessity owing to the slow and uncertain deliveries occasioned by transportation difficulties, others through the incentive of saving in cost of the articles. This has been especially true of the manufacture of cartons, which are used extensively for inner tubes, druggists' sundries, footwear, heels, and sporting goods. The manufacture of a suitable container not only prevents deterioration of the goods on the dealer's shelves but also acts as a sales and advertising accelerator.



American Type Founders Co.

Fig. 1. Hartford Cutting and Creasing Press

Two Types of Carton Plants

Today there is a hardly a plant which does not make boxes of one type or another. Some of the larger plants have simply duplicated an ordinary commercial box factory, making a box and cover out of chip mill board covered with glazed paper. Such a plant takes more floor space than the making of a set-up box, but this is offset by economies in the purchasing of raw material.

Scoring and Cutting Cartons

In this first type of plant, the starting operation is the cutting and creasing of the board which comes from the board mill in sheets, usually large enough to cut six or more blanks. There are several types of scoring and cutting machines, one in which the sheet is fed under a series of circular knives or scorers which creases the lines where folds are needed. Then it automatically creases the lines at right angles and cuts out the blanks. The second type of machine is the cutting and creasing press shown in Fig. 1. This is an adaptation of the job printing press, the forms for creasing being set in a chase with printer's brass rule, and the sheets are fed one at a time by the operator.

Forming the Box

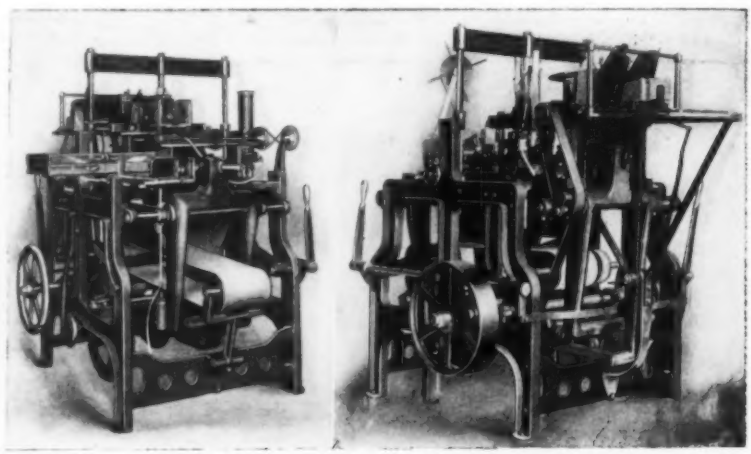
After cutting, the box is ready to be formed. Instead of being cut in the form of an exaggerated cross, this type of box is cut out with the ends separate to conserve stock in cutting. The automatic double ending and quadruple staying machines shown in Fig. 2 are the most common types used. The double ender operates by means of a plunger which forms the box and applies the ends at the same time. Cold gum is used as an adhesive. Owing to the weakness on the corners, this box must go through the corner-staying process, which consists in pasting a strip of tough-fibered paper around each corner or inserting wire staples with a stapling machine, shown in Fig. 3.

The boxes are then covered with glazed paper strip fed from a roll and gummed. Some plants reinforce the lid by inserting a piece of string under the glaze. The covering process is performed by stripping machines for the box and topping machines for the lids, whereby the shell is inserted in a form and the glazed paper applied by revolving the form, the operator running her forefinger along in front of the paper to lay the flange of the cover flat upon the form.

Making Shoe Cartons

Another type of box is cut out in one piece on a cutting and creasing press, the flanges on the sides being folded in and gummed to the ends. This makes a much stronger type of box although causing more waste. The autobox machine shown in Fig. 4 is used for setting up both the box and lid and can be adjusted to make any desired size of carton. These boxes if made of rough chip board are then covered in the same manner as the first type of box described above.

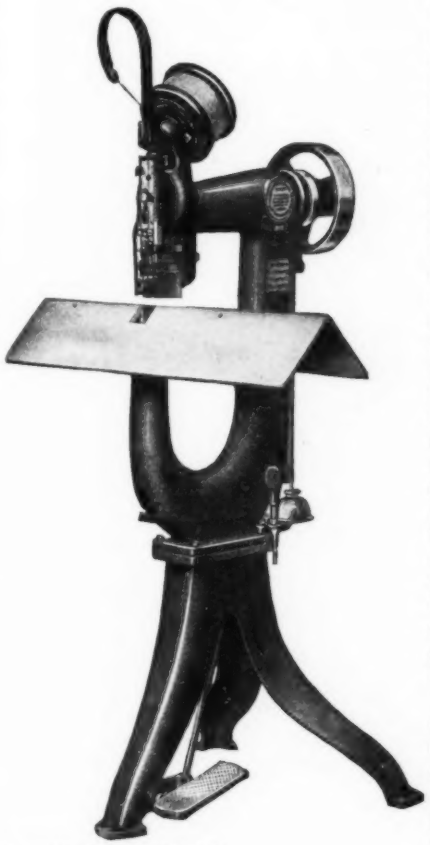
In these two methods the manufacturer performs all of the operations from the raw board through to the finished box. Plants with limited space for making cartons are now using another type



Kingsbury & Davis Machine Co.

Fig. 2. Double Ender and Quadruple Stayer

of machine, which takes the blanks cut and prepared by firms making this a business and forms the box and lid, two machines being sufficient to handle 15,000 boxes and lids per day. The shell blank of the box is cut out in one piece, but instead of being cut on the creases it is merely scored. This feature and the heavier type of board used make the box stronger and less liable to break open and present a slovenly appearance on the dealer's shelves. The type of board used is flexible, tough stock with a smooth white finish on one side, costing about 50 per cent more than the common board, which is offset by the fact that it does not necessitate covering with glaze and the surface will take printing in its original form.



American Type Founders Co.

Fig. 3. Boston Wire Stitcher

Fig. 5 shows this type of box machine. The cut blanks are fed into the hopper at the base of which is a set of revolving wheels in which are inserted pieces of soft rubber which are set so that the blanks automatically pass through the machine in rotation. The blank then passes over rollers which apply the glue from electrically heated glue pots. This feature of hot glue makes a stronger adhesion throughout the finished article. After the adhesive is applied the blank drops on the form and a plunger forms the finished boxes which feed out automatically and are nested by a boy helper. This machine is built along the lines of a modern rotary printing press and is very fast, 50 boxes a minute being the maximum production on a small size.

The lid machine takes a blank with a double end which folds over and incases the tab, making a very strong cover which does not require any wire staples or extra staying to make it durable. The cut lid blanks are fed into the machine in the same manner as the box machine, automatic plungers bending the tabs before they pass over the glue pot. The blank then drops on the form which presses out and shapes the lids automatically, at the same time folding over and tucking in the ends of the cover, a very ingenious operation. Fig. 6 shows this machine.

A plant making boxes by this method occupies a floor space of 64 feet square, allowing space for the accommodation of 60,000 finished covers and boxes and a labeling unit. A foreman and four operators are required for the machines, which makes the labor cost low.

Special Cartons

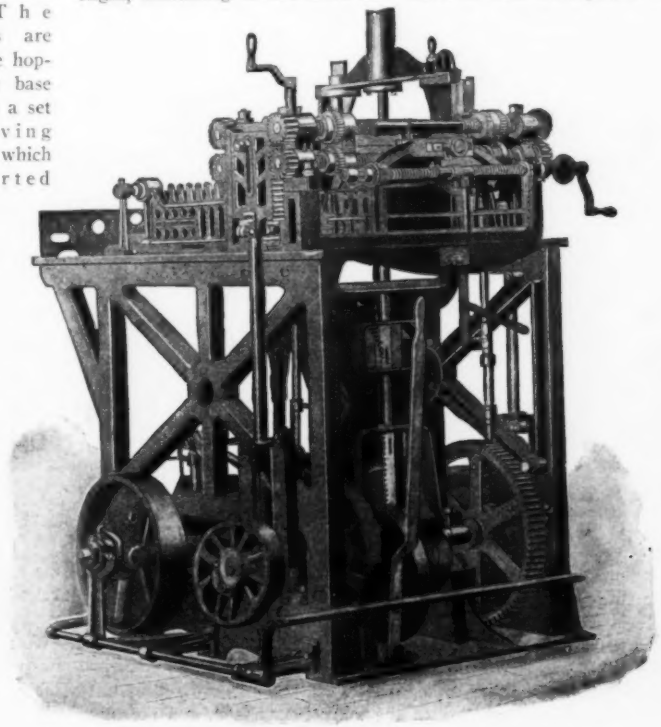
The boxes described in the three foregoing methods are the type used largely for rubber footwear. Inner tube boxes can be made by the same method by manufacturing two boxes, one larger than the other, and telescoping one over the other.

Before these cartons are ready for the packing department they must be labeled. This process is done by two different methods. A modern machine similar to the job printing press with interchangeable plates prints the label on the end of the carton with one or two colors in one operation. Some manufacturers prefer a more elaborate label, printed in colors in large sheets, cut up and pasted and applied by hand. This is done by laying the labels face down on a piece of damp cheese-cloth and applying hot paste with a brush. This paste is made with starch, water, and live steam. The labels are then picked up, applied to the boxes nested in dozens, and covered in one operation. A fast operator and labeler can label and cover 5,000 boxes a day.

Boxes for rubber heels, druggists' sundries, etc., are of a different type, being printed in various colors on all sides. These are produced on a rotary automatic carton machine shown in Fig. 7, the stock being run through in a roll, cut, scored, and printed in one operation. Of heel boxes alone it takes 15,000,000 a year to supply one large plant, so some idea can be obtained of the volume of this class of goods. Occasionally plants which use boxes of ten or more sizes find it economic to manufacture the staple and largest sizes themselves, purchasing on the outside the odd sizes in small quantities.

Auxiliary Equipment

Aside from the machinery outlined, heating units for mixing adhesives, and racks and containers for carrying boxes to the packing department are the only other equipment needed. The power required for the operation of the plant is comparatively slight, amounting to not more than three or four horsepower in



American Type Founders Co.

Fig. 4. The Autobox Machine

a 10,000 pair plant. Live steam from a ½-inch pipe is desirable, although this is not necessary if cold adhesives are used.

Women and Girls Employed

Labor employed usually consists of women and girls in the stripping and topping operations, men and boys for operating machines, and girls for labeling by hand and machine. The foreman should be thoroughly conversant with the type of machinery used and able to make small repairs and mechanical adjustments necessary. Machine operators must be trained in the proper care of the machines and making changes from one size to another, which can be made during noon hour or after hours so as not to interrupt the machine production.

Fig. 5. International Box Machine

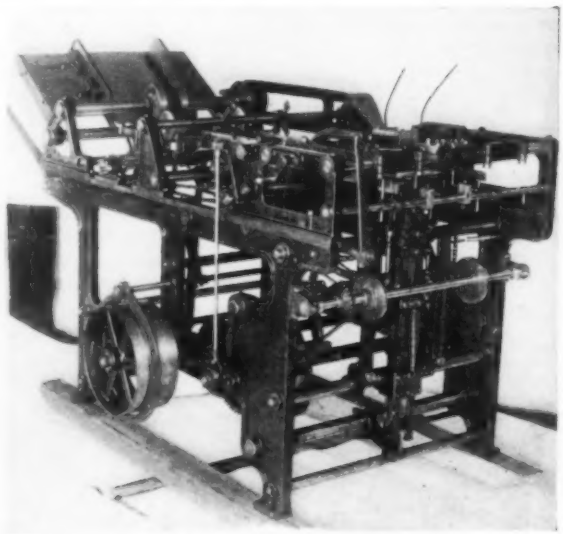
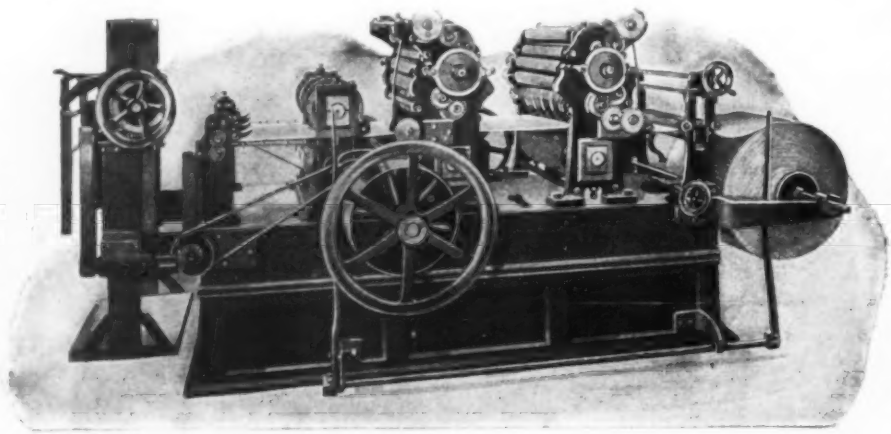


Fig. 6. International Lid Machine

The Waste Item

Waste is an item which must be watched closely. It should not run over 1 per cent on the machines, and by proper training and discipline, the plant can be kept neat and orderly despite the number of small, easily breakable units which must be handled. Operatives on the machines are paid piece work, although on some types of machines bonuses for production and low waste percentages work out to advantage.



American Type Founders Co.

Fig. 7. Automatic Two-Color Carton Machine

Cost of Manufacture

Shoe cartons for footwear cost on an average 2½ cents apiece when purchased from outside concerns, so that a saving of ½-cent a carton, which is possible in a well-managed box department, would mean $50 a day in a 10,000-pair-a-day plant, or $15,000 a year. On shoe boxes costing $20 per 1,000 to produce, the cost is generally divided into $6 for labor, $6 for overhead, and $8 for raw material. This last figure fluctuates according to the market on board, and the box plant must have the cooperation of a purchasing agent who follows the market, to obtain the benefits of cheap raw materials.

Any rubber plant using a volume of 10,000 cartons or more a day will find its capital well invested to install a box plant of its own.

CONFIDENCE AND COOPERATION IN THE TIRE BUSINESS

Under the title "Confidence in the Making," George J. Burger, the newly elected president of The National Tire Dealers' Association, sets forth, in a short article, some of his ideas regarding conditions at present prevailing in the tire trade industry, adding also certain suggestions for their improvement.

Mr. Burger, who for a number of years has been president of the H. & B. Auto Sales Co., and for the past two years head of the Greater New York Tire Dealers' Association, believes thoroughly in cooperation among dealers but also contends for better business practices. He holds that in the carrying forward of his business the dealer too often lacks system and is even sometimes ignorant concerning simple accounting methods. Price cutting, according to Mr. Burger, is sternly related to overhead, and the dealer must be perfectly familiar with ordinary expense items before reducing tire prices much.

A reputable dealer, however, who confines his attention to one or possibly two makes of tires and, above all, carefully studies his business, should avoid being cast upon the rocks of receivership. A thorough knowledge of his own line of work, in its various departments will give the dealer confidence—"the big thing needed in the tire business of today."

Water Dispersions from Coagulated Rubber, Balata, and Gutta Percha—I

By John B. Tuttle[1]

ABOUT ten years ago during the course of a friendly conversation between William Beach Pratt and a prominent rubber authority, they discussed the subject of the nature of the rubber particles in coagulated rubber. Mr. Pratt had a vision that the rubber particles in crude rubber existed in the same size and general conditions as they did in the rubber latex and argued, therefore, that assuming this to be the case, it should be possible to again separate these particles or to suspend them in such a way as to get a water solution or dispersion of rubber particles. This dispersion should resemble, and very likely have many of the properties of, the natural rubber latex. The rubber man replied to this that the matter seemed entirely too visionary, but that he would do this: he would boil an egg and send it to Mr. Pratt and after the latter had deboiled the egg then it would be time enough to take up the harder question of decoagulating rubber and restoring it to the original condition as it exists in latex.

Up to the present time, as far as we are aware, no one has succeeded in deboiling an egg, but the decoagulation of rubber is now an accomplished fact. Having succeeded in dispersing rubber in water, it proved to be a comparatively easy step to go on and do the same with balata and gutta percha, but it is largely the question of water dispersions of rubber with which we propose to deal in this article.

Rubber Latex

The literature is too full of data concerning the gathering and preserving of rubber latex and the constituents thereof to require that we go into any great detail at this time. In the method of coagulation employed in the preparation of Pará rubber, we know that a larger proportion of the constituents of the latex other than rubber are included in the crude rubber than is the case in the preparation of the usual grades of plantation rubber. As far as the latter are concerned, the nearest approach to Pará rubber, so far as latex impurities are concerned, is obtained in the so-called slab rubber. Even in the case of Pará and slab rubber, the crude rubber as it is received does not contain all of the dissolved or suspended substances contained in the latex. Furthermore, judging from the work of Eaton and others, it is questionable whether or not the non-rubber substances are in exactly the same condition as they were in the original latex. There is a possibility of both chemical and physical alteration which would yield substances of a different chemical nature from those of the latex. A still further difference between rubber in the latex and in the crude forms, such as Pará biscuits or plantation smoked sheets, is the introduction of small amounts of preservatives from the smoking process. Thus, it is apparent that from the rubber latex to crude rubber there is a considerable change in composition.

The non-rubber substances which exist in crude rubber may be grouped under three headings: (1) The so-called rubber resins—being the substances which may be dissolved out of the crude rubber by solution in acetone; (2) The insoluble matter or proteins; (3) The small quantities of organic accelerators which exist in the latex or which may be formed during or after coagulation.

For a long time the question of finding new uses for rubber was not of particular importance. It was with great difficulty that the production of crude rubber kept pace with the increasing demands of the rubber industry. There was no available surplus of crude rubber to justify any investigations aiming at new uses, for it was quite apparent that any increase in demand for crude rubber would succeed only in making the existing supply just that much more difficult and expensive to obtain. The subject was certainly of no interest to rubber manufacturers, and the planters were too busy attempting to build up their production to worry about the possibility of a future glutting of the market with supplies of crude rubber. During the period from 1910 to 1920 we saw the production of the plantations grow at such an astounding rate that by the latter date production of crude rubber had not only caught up with the consumption but actually surpassed it. The result was a tremendous decline in the value of rubber which, for the first time in years, offered inducements to any one who could succeed in finding new uses for it. The planters greatly desired such an outlet because it would bring the price of crude rubber back to a point where their plantations could be operated with a margin of profit, and the rubber manufacturers, or at least those who gave the matter any serious thought, were in favor of such work because it would tend to stabilize and prevent enormous fluctuations in the crude rubber market.

Of the various attempts to find new uses for rubber probably one of the most interesting is that of Frederick Kaye. He has worked out a process for the introduction of rubber into paper by the use of rubber latex. His claims are that a stronger, more pliable and durable paper is obtained by the introduction of amounts of two per cent or less of the dried rubber. In his lecture[2] at a meeting of the Institution of Rubber Industry, on September 4, 1922, he stated: "Practical commercial experiments in many mills have shown that all grades and qualities of paper can be improved in some regard by the use of rubber latex." However successful may have been the results obtained by the continental mills, the fact remains that in this country the results of the experiments of our paper mills have not been satisfactory. Part of the trouble may have been due to the condition of the latex. As received here, it has proved to be a rather variable substance, being frequently coagulated into a solid mass which, of course, cannot be used. Moreover, almost all of the usable latex contained a considerable quantity of coagulated lumps, which had to be strained out of the latex before the latter could be used.

In studying the use of rubber latex in paper making, Pratt went back to his original theory, as expressed to the rubber man some ten years ago, that it should be practicable to separate the rubber globules, and if this could be done the uniformity which would be obtained might solve the greater part of the troubles which the paper makers were encountering.

Kaye Says Rubber Latex Cannot Be Made

Answering an article[3] by Gustav Heinsohn, Kaye says: "All practical rubber men know that rubber solution is made by masticating coagulated rubber upon hot rollers and then treating this material with some organic solvent—such as naphtha, benzol, benzine, etc., or with carbon bisulphide, etc. According to C. O. Weber, the solvent dissolves in the rubber and not the rubber in the solvent. It is impossible to mix any of these 'solutions of rubber' with water and, therefore, they are all inadmissible in a true papermaking process.

[1] Consulting chemist, 68 Bank street, New York, N. Y.

[2] THE INDIA RUBBER JOURNAL, September 9, 1922, 64, 19-26.
[3] THE INDIA RUBBER WORLD, September 1, 1922, 66, 795-6.

"Rubber latex, on the other hand, cannot be made; it is produced by nature and used as taken from the rubber-yielding tree, but sometimes preserved by a suitable anti-coagulant. It is a colloidal solution, consisting of infinitely minute particles of liquid rubber, intimately dispersed in the water or serum from the lacticiferous tubes of the tree. It is miscible with water in all proportions . . ."

In a way, Kaye is correct. Rubber latex is formed in nature by the rubber trees; it can be preserved in this form, as for example, by the addition of ammonia, but just as soon as coagulation sets in, there is a separation of some of the constituents of the latex from the coagulated rubber, and the product which we know as crude rubber contains only a part of the total solids of the latex. Hence, no matter how completely this crude rubber may be dispersed in a liquid, we cannot get a latex with it alone. If, however, as we shall see later on is actually the case, this rubber can be dispersed in water, it is a very simple matter to argue that if we add to such a dispersion the serum drawn off during the coagulation of latex, we would have actually a product which would be as near the original rubber latex as the material which Kaye used in his papermaking experiments. It is probably just as well to get these facts established because it should be realized that water dispersions of crude rubber are not latex and, therefore, cannot be expected to react precisely as a latex would. By this, we do not mean that these rubber dispersions may not have many of the physical and chemical properties of a rubber latex; they have definite properties of their own, which may or may not be the same as those of a true latex, and no doubt these properties will influence, if not entirely control, the uses to which they can be put.

Previous Attempts to Prepare Rubber Dispersions

Heinsohn, after an exhaustive study of the subject, found but three attempts to prepare rubber "milk."[4] Leudersdorff's so-called rubber milk was made in two ways. The first was a sort of rubber dough and seemed to be largely a matter of mechanical mixture of rubber and water rather than a permanent dispersion. By adding a thick gum arabic paste to the rubber dough he got a mixture which when poured into water gave up its gum arabic and the dissolved rubber floated on the surface in the manner of a thick cream. There is nothing to show how large or small the particles were, and hence we cannot say whether or not they were anywhere near the size of the particles in rubber latex. It is quite likely that what he really obtained was a suspension of agglomerates of the rubber particles. Nothing is said regarding the extent to which it can be diluted, its permanence, or the ability to recover the rubber after coagulation. The other two cases of rubber milk were those of Alexander and Traun. In both of them, however, the raw material is vulcanized rubber, the chemical composition of which is known to be distinctly different from that of crude rubber and hence in no way can the product of such dispersion, or milk, be compared with rubber latex. This is particularly true of the Alexander product, which by reason of the process used in its manufacture, must have contained a large amount of depolymerized vulcanized rubber.

Pratt's Rubber Dispersion

It is unfortunate, although unavoidable, that at the present writing, it is impossible to give the details of the Pratt process. The status of the patents does not permit of this disclosure being made in this issue, but a further article, taking up the more technical side of the subject, is in preparation, and should be ready for publication in this journal in the March number. Unquestionably by that time, it will be possible to give all the particulars necessary. The dispersions obtained by this method can be diluted in the same manner and to at least the extent that rubber latex can be diluted, without spontaneous coagulation taking place. Coagulation can be effected by the adding of acetic acid in the same manner and in the same proportion in which it is used with natural latex, or by the use of any of the other coagulants as they are used commercially. The coagulum can be washed and dried and the coagulated rubber vulcanized in the usual way. The tests made so far show that this coagulated rubber vulcanizes in the same manner as the original pale crêpe from which it was made and shows no appreciable differences in properties.

This rubber dispersion is capable of being stored for a long time; just how long cannot be stated at the present writing, as some samples now on hand which were prepared some months ago, are still as liquid as they were in the beginning, and show no signs of breaking up or spontaneous coagulation. The dispersions of rubber and rubber latex, when suitably magnified, show the Brownian movement. In all of the samples prepared to date, it has been noted that irrespective of the lot of crude rubber used in preparing the dispersions, the rubber particles are of about the same average size, and what is even more striking is the fact that these particles are approximately the same size as the rubber particles in the latex. In this connection there seems to be considerable evidence that the extent or rapidity of the movement is in some way connected with the concentration of ammonia because it has been noted that rubber dispersions prepared by the standardized method can be made to lose practically all of their motion on standing, thus permitting the ammonia to evaporate. This same dispersion can be made active again by the simple expedient of adding a few drops of ammonia. Of course, in doing this the solution was never allowed to approach coagulation.

In this connection it is, perhaps, noteworthy to call attention to the particle size. Water dispersions of sulphur, toron, and other substances have been obtained in which the particles show the same Brownian movement, but are very much smaller than the particles of rubber. These facts seem to bear out strongly Pratt's original hypothesis that the coagulated rubber contained the rubber particles in the same size as they existed in the latex.

General Discussion

From the work of de Vries, Stevens, Eaton and others, it is pretty well established that there exists a variation in the true quality of the rubber as it comes from the trees. This variation we can only hope will be made as small as possible through a continuation of the splendid work which has been done by the Government and private laboratories which have been working on this problem. The Pratt process will not change this type of variation.

We have another type of variation, namely, that caused by the variation in the substances held by the coagulated rubber, and which are not removed during the washing. The possibilities of the Pratt process are such that it is easily conceivable that this type of variation can be reduced. It has been stated that coagulated rubber can be dispersed in water, and recoagulated, but it necessarily follows that one is not limited to a single cycle of operations but inasmuch as it is possible to reproduce the rubber particles in their original size and condition, the suspension in water and coagulation can be repeated indefinitely. We must emphasize the fact that rubber dispersions in water are not the same as rubber latex. One reason why they cannot be the same is that in coagulation, some of the non-rubber constituents of the latex remain in the serum and are removed during the washing. Doubtless some of these substances, which might be washed out are held in the rubber in an occluded condition. By coagulating again after suspending the rubber in water, a still further quantity of these soluble substances should be removed. Thus, each successive cycle would grow farther and farther away from the composition of the rubber latex, without interfering with the actual quality of the rubber itself. As a means of preparing rubbers free from some of these non-rubber constituents of the latex, this method seems very attractive. The plantations always run into rubber which has been coagulated prematurely—on the tree, in

[4] THE INDIA RUBBER WORLD, 1922, 67, 137-8.

the cups, or elsewhere. It is now a simple and easy matter to again restore the rubber to a water dispersion and then coagulate under more desirable conditions. The result is a lowering of the percentage of the off-grade rubbers.

In accepting the picture of the structure of the crude rubber as particles in the shape of small globules surrounded by a film of some protective substance which persists from one coagulation to another, we also get a clearer picture of what happens to crude rubber when we, by whatever means by which it can be accomplished, do break this protective shell. We would expect that rubber in such condition would not react as ordinary rubber does. In practice, this is exactly what happens—in a tacky or low grade rubber the dispersion differs from ordinary dispersions in that there is a percentage of material which cannot be dispersed.

These tacky rubbers always contain a large percentage of material soluble in solvents, such as acetone and alcohol, which will not dissolve rubber in its ordinary condition. We have been accustomed to explaining it as depolymerization, and that the particles of smaller size or grouping have higher solubilities in these solvents than the highly polymerized rubber. But is it not possible that all we have done is to break down or fracture what amounts to a semi-permeable membrane? In the case of perfectly protected particles, the solvents which will dissolve rubber are really those which can pass through this membrane, and what we have in the case of cements formed with any of the well-known solvents, such as naphtha, carbon bisulphide, benzene, chloroform, etc., is a number of "balloons" floating or suspended in an excess of the solvent. The "balloons" consist of the protective coating, whatever that may be, and inside the balloon we have the true rubber substance, which has taken up as much solvent as can get through the semi-permeable membrane. Obviously, the latter must be capable of stretching, and possibly the limit of its capacity to stretch is the limit to the amount of solvent which can pass through it. Certainly such a hypothesis fits many of the phenomena noted in rubber solutions, as well as the fact that in rubber dispersions in water, the particles are of the same size as the rubber particles in rubber latex. If there exists, as we postulate, a protective coating, may it not be a protection against oxidation, as well as against solution? And if this be the case, may it not explain why tacky rubbers are also oxidized rubbers containing a high percentage of soluble matter?

Again, working on the theory that such a protective coating exists, it is interesting to follow it through vulcanization.

It takes only a slight degree of vulcanization to bring rubber into a condition in which it will not dissolve in solvents. However, here still we have the swelling as when soft vulcanized rubber swells in the ordinary rubber solvents. We have often taken a rubber band, and after immersing it in chloroform (or after it has been subjected to the chloroform extraction), noted how easily it could be crumbled while still swollen, whereas after driving off the chloroform, the rubber regains its tensile strength and elasticity (stretch). It does seem as if the vulcanization, quite apart from anything which it has done to the rubber substance inside the "balloons," has in some manner caused coalescence between the protective coatings of the balloons. Swelling with solvent extends this coating to such an extent as to permit of easy mechanical separation.

Of course, this is pure speculation, but it at least affords us an opportunity of making a mental picture of the various reactions which may be of some help in studying the phenomena of water dispersions and rubber latex.

Conclusion

In this first article of the series, we have confined ourselves largely to the development of the use of rubber latex, and with the question of dispersing coagulated rubber in water. The second article will take up the subject of other and similar dispersions, such as sulphur, accelerators, and the other materials which go to make up a rubber compound. The third will cover a detailed technical description and discussion of the process.

From the foregoing, it is apparent that "decoagulating" crude rubber is an accomplished fact. It seems only reasonable, and fair, to say that now it is up to the "rubber expert" to show us how to solve the easier problem, namely, how to deboil an egg.

Dunlop Tire & Rubber Corporation of America Reorganized

Having completed reorganization plans, The Dunlop Tire & Rubber Corporation of America expects to reopen, about March 1, its $20,000,000 plant at Buffalo, New York. Production at first will average about 20 per cent of the factory's daily capacity of 12,500 tires, including solids. The larger part of the machinery has already been installed.

The corporation is a subsidiary of The Dunlop Rubber Co., Limited, of England, and the plant at Buffalo, representing the American organization, was completed in 1920. The machinery and buildings alone are said to be valued at $16,000,000, while there are 500 acres of land which are reported to be worth several millions more. With the promise of better things for the automotive industry, the Dunlop organization in America has been recently refinanced through the issuance of $15,886,000 first mortgage 7 per cent bonds to a syndicate of New York bankers. The entire issue has been already oversubscribed, the principal, interest and sinking fund being also guaranteed by the English company, which is said to have an equity interest of 96.34 per cent in the American concern.

The personnel of the United States organization will be new throughout. Sir Eric Geddes, brother of the British Ambassador at Washington, will act as chairman of the board, while Edward B. Germain, who has served seven years in an executive capacity with the Bethlehem Shipbuilding Corporation, becomes president and general manager. Frederic C. Walcott, originally president of the American company, is also an important member of the executive committee.

On the American board of directors serving under Sir Eric are Frederick W. Allen of Lee, Higginson & Co., representing the banking interests; Pierre du Pont, J. J. Storrow, Sir George Beharrell, Robert K. Pomeroy, Louis Bergen and Charles A. Proctor. Directors of the English company are Frederic C. Walcott and J. Westren. Sir Eric is chairman of both the English and American boards.

TWENTY-THIRD NATIONAL AUTOMOBILE SHOW

The sponsors for the twenty-third National Automobile Show are devoting their efforts to making the occasion a successful one. The 1923 exhibits will be held in the Grand Central Palace, New York, N. Y., January 6 to 13, and in the Coliseum and Armory, Chicago, Illinois, January 27 to February 3. With indications for more prosperous conditions in the industry, this year's exposition will undoubtedly prove of even more interest and importance than usual. At the present time 83 manufacturers are listed as exhibitors, as well as many hundreds of those who specialize in the production of accessories.

CHICAGO TO HOLD GOOD ROADS CONGRESS AND SHOW

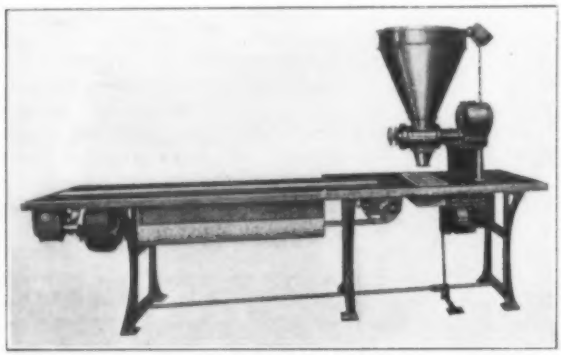
Under the auspices of the American Road Builders' Association there will be held January 15-19, in the Coliseum, Chicago, Illinois, the Thirteenth Annual Good Roads Congress and the Fourteenth National Good Roads Show. It is expected that the session will further the cause of the enactment of uniform highway traffic regulations throughout the country. E. L. Powers, 37 West 39th street, New York, N. Y., is secretary of the American Road Builders' Association.

Manufacture of Hot Molded Hard Plastics

Special Technical Qualifications—Conditions Governing Successful Molding—Plan of Molding Unit—Accessory Machinery and Methods of Operation—The Molding Cycle

Technical Qualifications

ARTICLES molded from hard plastic products outwardly resemble those of hard rubber, and are often called hard rubber substitutes. Shellac composition, phenolic resin and cold molded products are worked with great facility at low cost and



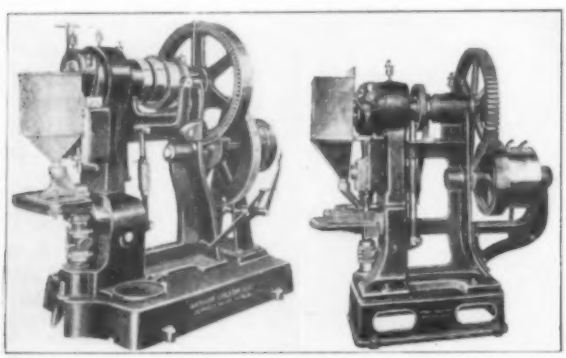
George G. Rodgers Machine Tool Works

Fig. 1. Automatic Powder Weighing Machine

possess hardness, luster and dielectric strength sufficient for many purposes.

These materials, however, should be considered from the point of view of technical value based on their physical properties because each has characteristics which determine its suitability for given purposes and make each the best for special work, apart from any saving in cost by substitution for hard rubber.

For example, shellac compositions mold with great fidelity without shrinkage but will soften at temperatures above 125 degrees F. Phenolic resins, such as bakelite, shrink .0025-inch in



Arthur Colton Co. *F. J. Stokes Machine Co.*

Fig. 2. Automatic Tableting Machine **Fig. 3. Single Plunger Automatic Tableting Machine**

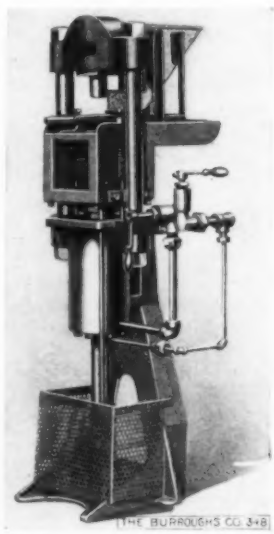
molding, are not injured by heat under 450 degrees F., and have high dielectric and mechanical strength. Cold molded bituminous products are the least expensive, shrink more or less erratically due to firing after molding, will withstand heat at 600 to 700 degrees F., and are cheaply produced.

In a previous article[1] details were given concerning phonograph record molding in shellac composition which represents the highest art in shellac molded work. In the present article molding phenolic resin compositions such as bakelite, condensite, and redmanol will be considered.

The Rubber Worker and Hard Plastics

It should be noted at the outset that successful molding of hard plastics requires an outfit of presses and molds differing in very important particulars from those used in molding rubber articles. Just as the rubber molder must use equipment and methods adapted to the chemical and physical characteristics of his rubber compounds, the hard plastic molder considers his equipment from corresponding standpoints regarding his special materials. The rubber worker and the plastic molder, each necessarily thinking in terms of his own material, have developed specializations in the molding art.

The introduction of rapid accelerators and the possibilities in rubber latex-casein molding make it worth while for the rubber worker to consider the rapid production methods of the hard plastic molder.



The Burroughs Co.

Fig. 4. Semi-Automatic Hydraulic Tableting Machine

Equipment for Hot Molded Hard Plastics

The molding room for hard plastic contains an array of hydraulic machinery and presses having a general resemblance to that found in a molded goods department of a rubber factory. The differences are due to the nature of the materials. The hot molded hard plastics are commonly bakelite, condensite and redmanol. These are all phenolic resins made and delivered in standard compositions in the form of powder, sheet or viscous fluid, the latter of course being for impregnating or coating purposes rather than molding.

The dry forms of powder or sheet are ready for immediate molding. Powder is used for articles of deep and irregular form, and sheets for shallow articles, thin plates, panels for radio work, etc.

Automatic Weighing

Powdered material may be handled by small hand scales to weigh correct portions for each mold cavity or for large scale production by automatic weighing of the type seen in Fig. 1. This is a simple self-contained electrically driven device comprising an adjustable valve to discharge up to 8 ounces or more of the powder from the stock hopper. The material is received in suitable paper cups which are set on the conveying belt for transfer from the operator who handles from 30 to 40 measured charges per minute.

For hand operated molds automatic weighing of the mold charges does very well. The machine is accurate, but there is liability of accidental loss of material at the molds resulting

[1] THE INDIA RUBBER WORLD, October 1, 1922, 16-18.

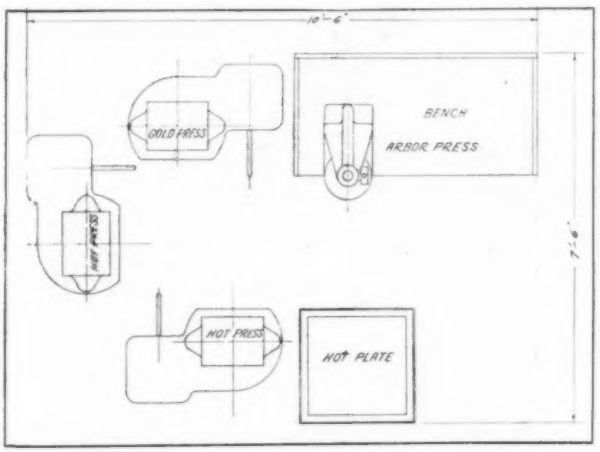
in imperfect work. The system also lacks in the convenience of handling possessed by the method of preforming the powder charge in easily handled tablets, which is a necessity in rapid production from multiple cavity and semi-automatic molds.

Tableting Machines

Forms of tablet performing machines are illustrated in Figs. 2, 3, and 4.

Fig. 2 shows an automatic machine capable of delivering from 50 to 250 tablets a minute according as a single punch or five punches are used.

Fig. 3 represents a tableting machine with single plunger for large tablets or by using multiple dies it will make a large number of smaller tablets. Multiple dies may have from three to 19 holes, depending on size. Tablets up to 2½ inches in diameter can be formed singly at the rate of 40 to 60 per minute.



The Burroughs Co.

Fig. 5. Plan of Molding Unit

Fig. 4 pictures a semi-automatic tableting press, hydraulically operated. In this machine the powder is released from the hopper by drawing out a hand slide filling the tablet die. Compression is effected by the upward rise of the ram, which, as it retracts, actuates a simple automatic ejector device to remove the tablet. The capacity of this machine as to size of tablet is up to 6 inches or more in diameter, the number a minute varying according to the number in each die impression.

Molding Press Unit

A well-studied plan for a one-man hand molding unit is shown in Fig. 5. It consists of a steam table for preheating molds and sheet stock, two hot presses and one chilling press, also a bench and arbor press for opening molds.

The operator stands surrounded by the group of presses and fills the molds for each press from the stock on the steam-table, opening the molds in turn with an ordinary arbor press at the bench and removing the product. With this arrangement it is possible to have three or four molds in operation at one time, insuring maximum production.

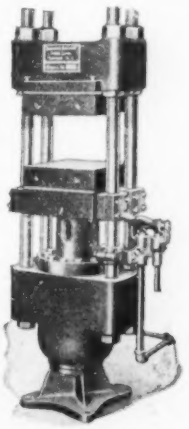
Typical Presses for Hand Molding

The type of press for hand molding may vary considerably. An ordinary side rod hydraulic press is illustrated in Fig. 6, which shows layers of thick asbestos packing intervening between the hot plates and the adjacent parts of the press for conservation of heat.

Semi-Automatic Presses

Semi-automatic presses are those in which the upper and lower parts of the molds or dies remain fixed. Presses of this sort frequently have the compression cylinder above and an ejector cylinder below.

The tilting head press is an exceptional development, as seen in Fig. 7. Here the top of the mold tilts back with the head of the machine, freely exposing both top and bottom dies for locating inserts, placing the tableted molding charge, removal of the finished object, and cleaning of the dies. The illustration shows the press open with tablets of preformed bakelite in the lower mold cavities and inserts screwed in place in the top dies or force.



Dunning & Boschert Co.

Fig. 6. Small Hand Mold Hydraulic Press

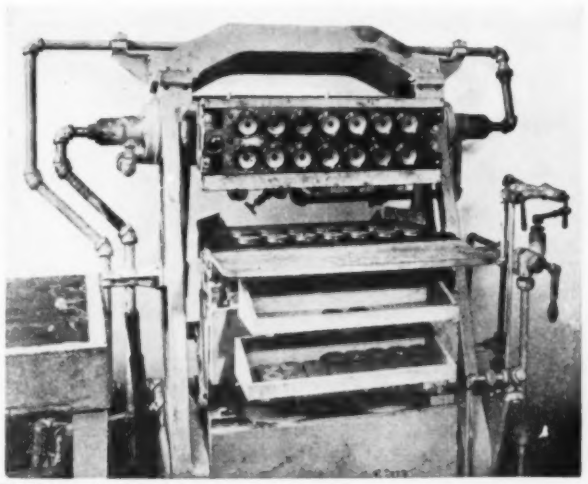
Bakelite Molds

In the case of deep or heavy articles it is necessary to provide circulation passages in the molds for rapid heating and cooling of the material, the cycle of which from fusing to cooling is very rapid. In designing the mold cavities a compression factor of 60 per cent is used, figuring on 350 degrees F. (150 pounds steam) and 2,000 pounds per square inch pressure. In other words, for a molded piece one inch thick a depth of mold of 2½ inches is required.

The molded articles come from the dies with whatever perfection of finish the molds impart, therefore the molds are usually given a lustrous finish by grinding or hubbing. For ease of working, machinery steel is used, the finished mold being case hardened by special treatment.

Molding

Forming an object from bakelite powder in an ordinary hydraulic press using a semi-automatic mold is seen in Fig. 8. The left view shows the act of pouring the weighed charge of bakelite powder into one of the lower die cavities. The right view exhibits the final operation and one of the molded articles which has been removed from the mold.



The Burroughs Co.

Fig. 7. Tilting Head Semi-Automatic Hydraulic Press

Plates and Thin Forms

For convenience in molding panels, plates, and thin articles in shallow molds, sheet stock is used. This is preheated on a steam-table by the pressman, who lays the stock between two plies of duck to keep it from adhering to the hot plate and to

conserve the heat. The plastic sheet is next cut by a knife to suitable size, transferred to the mold rapidly to induce fusion, held under pressure till hardened and then rapidly cooled.

Temperature and Pressure

The recommended molding temperature is 350 degrees F. and the pressure from 500 to 2,000 pounds per square inch. The temperature may be as low as 325 degrees and the pressure down to 500 pounds in special cases. Temperature for full fusion seems to be more important than pressure for successful molding. Plates, panels, thin and very small objects can be removed from the mold before cooling, without injury to the product except slight dulling of the finish.

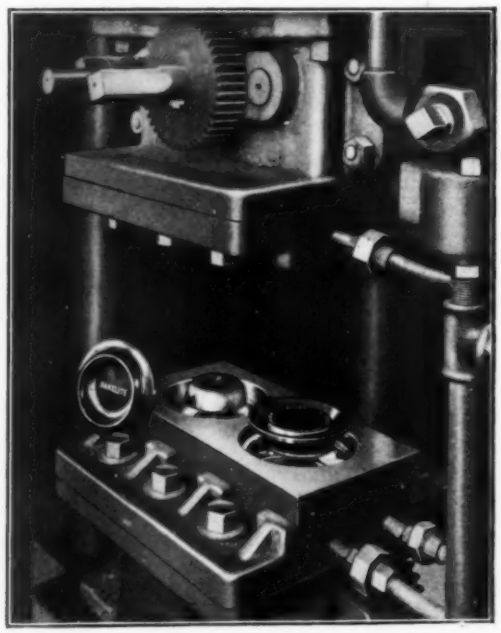
Phenolic resin compositions are hard granular powders that exert more or less abrasive effect on the highly polished surfaces of the molds if crushed cold in them, hence heavy molding pressures should begin gradually and build up steadily on the material as it softens to full fusion.

Mold Finish

The mirror-like finish of the molds is transferred in perfection to the hardened product only by cooling the material under pressure, otherwise a peculiar, fine pebbled effect is noticeable on the finished article visible when the surface is viewed at certain angles. This effect is technically called "dog skin," and is evidence of poor skill in molding.

The Molding Cycle

In a semi-automatic press using molds in which the force and die contain passages for circulating steam or water, molded objects can be produced with great rapidity, especially from preformed tablets and mold ejectors.



The General Bakelite Co.

Fig. 8. Molding Powdered Bakelite

Under such conditions the stock can be made to fuse and flow in 30 seconds, harden or set in 120 seconds, and cool in 30 seconds, or three minutes from raw stock to finished molded piece ready for use.

Metal Inserts

Inserts for electric or mechanical attachment are accurately molded into place by means of provision designed to hold them. The flow of the material leaves them undisturbed as located in the piece by the mold. Usually the inserts are of brass and are cheaply produced on screw machines.

Exhibitions and Conventions

Exhibitions

Jan. 6-13—New York, National Automobile Show, Grand Central Palace.
Jan. 27-Feb. 3—Chicago, Annual Automobile Show, Coliseum, and First Regiment Armory.

Conventions

Jan. 8—New York, National Automobile Chamber of Commerce Export Manufacturers' Convention.
Jan. 8-9—New York, The Rubber Association of America, Inc., Annual Meeting and Dinner, Waldorf-Astoria.
Jan. 9—New York, National Motor Truck Committee Meeting, N. A. C. C. Headquarters.
Jan. 9—New York, National Automobile Chamber of Commerce, Annual Dinner, Hotel Commodore.
Jan. 9-12—New York, Society of Automotive Engineers' Annual Meeting.
Jan. 10—New York, National Automobile Chamber of Commerce Directors' Meeting.
Jan. 10—New York, Motor and Accessory Manufacturers' Association Dinner, Hotel Commodore.
Jan. 11—New York, Society of Automotive Engineers, Annual Dinner, Pennsylvania Hotel.
Jan. 15-19—Chicago, Thirteenth American Good Roads Congress and Fourteenth National Good Roads Show.
Jan. 27—Chicago, National Automobile Dealers' Association Directors' Meeting, La Salle Hotel.
Jan. 29-31—Chicago, Automotive Electrical Association Annual Meeting, Congress Hotel.
Jan. 30—Chicago, Midwest Rubber Manufacturers' Association, Annual Dinner, Hotel Morrison.
Jan. 31—Chicago, Society of Automotive Engineers, Meeting and Dinner, Congress Hotel.
April 3-7—New Haven, Connecticut, American Chemical Society, Spring Meeting.

Foreign Exhibitions

Sept. 7-March 31—Rio de Janeiro, Brazil, Brazilian Centennial Exposition.
Dec. 15-Jan 2—Paris, International Aero Exposition, Grand Palais.
Jan. 13-24—Brussels, Sixteenth International Automobile and Cycle Exposition, Palais de la Cinquantenaire.
April-July, 1923—Gothenburg, Sweden, International Automobile Exhibition, sponsored by Royal Automobile Club of Sweden.

NATIONAL FOREIGN TRADE COUNCIL ADVISER SERVICE

The National Foreign Trade Council, India House, New York, N. Y., has recently organized a permanent trade adviser service, to act as a medium for the interchange of experience on foreign trade problems. The personnel is made up of men connected with some of the leading industries of the country, among whom are: Lawrence & Co., the Barber Asphalt Co., and the United States Rubber Export Co.

How to Revive the Fiber Sole Business[1]

Improved Soles, Standardization and Cooperation with Leather Shoe Manufacturers Are of Cardinal Importance

By Chester C. Burnham

THE inherent good qualities to be found in fiber soles will eventually overcome the mistakes of the past and win the confidence of the shoemaking, shoe repairing and shoe wearing public. Before this can come about, however, there are certain things which should be done and thus we are unquestionably confronted with the problem of finding proper methods of hastening the return of fiber soles to popularity and general use.

Not all the introductory work of the past eight or nine years has gone to waste, and even though some of this energy has been misdirected, it can still be turned about for good. The actual mistakes can be forgotten and laid forever aside while the good can be amplified many times over and made to build up the new trade.

Better Soles and Better Marketing Principles

Before we again obtain a large volume of fiber sole business we shall have to make some changes in the sole itself and observe certain important principles in marketing it. Looking back over the successes and failures of the past and guided solely by the facts as they are, rather than as we wish they were, we must: First, make fiber soles more nearly trouble proof; second, secure more thorough cooperation from the shoe manufacturer and shoe repairer to the end that the soles may be better attached.

The government report cited in last month's article shows plainly that we must make them more trouble proof. To quote it for a moment, "the wearing and breaking off at the toe and the pulling out of stitches are typical ways in which composition soles fail."

It is understood that all of the shoes used in this government test were made especially for the test and it was a known fact when they were cut and made, that they were to be so used. Certainly then, we have every reason to believe that they should be in every way the best we could produce. In spite of this, however, 18 out of a total of 40 pairs under test failed, not because they did not give wearing service, but because they could not withstand ordinary shoemaking practices. This fact shaved clean of all excuses and extenuating circumstances is rather startling and leads us to one of two conclusions: (1) Either fiber soles must be so compounded and so constructed as to withstand these shoemaking practices or (2) shoe manufacturers must use approved and proper practices when attaching fiber soles in order that the characteristic properties of the sole may not be destroyed and to the end that the utmost in wear and service may be retained for the wearer.

It is entirely possible to improve many of the fiber soles which are now, or have been placed, on the market but it is doubtful if we can ever build a fiber sole of which we can truthfully say to all shoe manufacturers, use this sole exactly as you would leather. It is very doubtful if any fiber sole can be so built as to withstand the tearing, cutting and disrupting action of a square-shanked, chisel-pointed awl; the combination of wrong awls, wrong sized threads, and awl and needle out of line in the stitching machine. It is even more doubtful if any fiber sole can ever withstand the action of the inexperienced or careless operator who insists in pulling his shoe ahead of the feed of the stitching machine when attaching fiber soles.

Rubber manufacturers have undoubtedly made a great mistake in saying to the shoe manufacturers, "You can treat my fiber sole exactly like leather," for it is precisely this that has done the most harm to the popularity of the fiber sole. Only a few weeks ago a fiber sole salesman told a shoe man that his sole could be put through the factory in exactly the same way as leather soles are treated. Recently, some of these soles were made up into shoes and the results are far from being what one would hope for.

Shoe manufacturers are fully convinced, after many troublesome adjustment cases with their trade, that the fiber sole has to have a far different bottom filling underneath it than does a leather sole. If indeed the cork composition filler is used at all, it must be firmly rolled down and the bottom fully and evenly filled. By far the better practice and the one coming into general favor is to fill the bottoms, in between the inseams, with sheet filling of some kind which has been cut to exact shape to fill this bottom. It is all very well for the fiber sole manufacturer to tell the shoe man that fiber soled shoes should be made with a slip sole or mid sole of leather underneath the fiber sole but of course you must realize that this brings up the material and labor cost of the shoe and does not put it in the class with single sole leather shoes. Leather requires no slip sole and yet the rubber man says, "Treat it just like leather."

Lower Gravity Soles

The fiber sole should be lighter weight. At the present time it is heavier than leather in addition to the handicap of its being necessary to use a thicker sole than leather to build comparatively the same shoe. Fiber sole compounds have been made with gravities about 1.10 or less and the present day heavy-gravity type of sole should be abandoned. It is reasonable to expect that very heavy soles will never make lightweight footwear and being heavy they will be forever condemned in the eyes of certain classes of trade. Fiber soles comparable with leather in weight would have *no handicaps so far as weight is concerned.*

Closely in hand with the matter of weight is that of density or stiffness. At the present time we are forced to use a 12-iron sole on a shoe which would require a 10 or 11-iron leather sole, in order to give a certain firmness to the bottom of the shoe. The average fiber sole of the past has been too rubbery—not enough like leather—to permit of its being used successfully in the lighter irons. One manufacturer was forced to give up a 7-iron fiber sole because it was found to be very unsatisfactory in shoe factory usage and in wearing service. Don't let me give you the impression that the sole itself did not have wear resisting features, for it had, but it was found to be so light that it would pull out of shape in attaching, or the lock of the thread would occasionally pull right through the sole. The wearer could feel every pebble or unevenness of the pavement through the sole.

A more dense sole is easier to cut and trim in the shoe factory. The softer sole creeps ahead of the rounding knife, or the abrasive trimming wheel when the edges are trimmed. This same softness makes impossible anything in the way of channeling or grooving. A more dense sole would better lend itself to nailing and it is entirely reasonable to expect that we may some day have a fiber sole that may be grooved and channelled for straight McKay work and even for turns. Some have actually succeeded in making infants' turn shoes with a fiber sole, while at least one concern for several seasons has successfully sold to the trade a line of straight McKay shoes (made without a mid sole).

[1] This article is not to be reprinted without special permission of THE INDIA RUBBER WORLD.

Standard Sizes

Fiber soles should be graded in size to comply with the regular leather sole grading of sizes. At the present time it seems as though each fiber sole manufacturer had seen fit to adopt his own standard and thus the shoe manufacturer is constantly confused when he desires to order various makes of soles. There should be a bond of mutual interest between the fiber sole manufacturer and the shoe trade which would make their several problems one of unselfish interest and cooperation. Size standardization is a genuine necessity.

The one detail in fiber soles that has shown the least progress is that of a proper and satisfactory method of finishing the edges and bottoms. All methods which have used wax edge inks and which have been subject to the usual "edge setting process" in the shoe factory, have been practical failures when the shoes were packed and repacked in sample trunks or when the shoes were tried on in the retail stores. Obviously, an edge finish that will not withstand handling does not rate much of a success. Most fiber soles are acid and alkali proof so it is a difficult problem to attain edge setting results through the ordinary methods of setting leather edges. The machinery concerns have perfected various abrasive wheels, abrasive belts and special trimming knives for getting the edges smooth and ready for the "setting" process but almost no effort and certainly no practical results have been obtained with the final finishes. Some liquid or chemical should be discovered that would do this work, even if it has to be applied by a special process or machine.

Fiber Soles for Boy and Girl Scouts

Talk with a dozen of your friends regarding fiber soles and you will find little enthusiasm. Talk with a dozen well-informed shoe manufacturers and you will find them disinterested also. Take up the matter with your local repairman or your local retailer and you will fail to evoke enthusiasm. All these facts prove conclusively that something must be done to revive general interest in fiber soles. Unquestionably the first thing necessary to this end is to secure the cooperation of the shoe manufacturer. Produce a sole that is right from a shoemaking standpoint and he will listen to a proposition. No better start could be made than to introduce a line of fiber soled footwear for boy scouts. Such shoes can be made to give wonderful service, and soles can be made that will resist stubbing and breaking, that will cling to grass, mud, and ice when hiking and which will be comfortable for long walks in any kind of weather. Follow this up with a shoe for girl scouts and the game is on in earnest. Build a sole and a shoe for policemen, letter carriers, railroad men, etc. Do you know that a fiber sole is a wonderful resistant to the action of hot cinders in the engine cab and at the roundhouse? Capitalize on that fact, but of course such a sole must also be stub-proof, the shoe must be well bottomed, and the sole properly stitched.

Experienced advertising men will tell you that the success of reaching the adult trade is often greatly influenced by the juvenile impressions and that if the boy scout shoe is properly exploited, new faith can be found in fiber soles and the proposition can be put over to any extent.

Why Fiber Soles Are Worth While

But why all this bother, some rubber manufacturer may remark as he reads this article. Here are some facts which will answer that interrogative. In May, 1915, a certain company produced 44 pairs of fiber soles. The product was more successful than some others had been and trade increased until in January, 1917, the production figures were over 1,000,000 pairs for the month. Had fiber soles *made good* at that time, it is probable that this and even greater production would have been possible for a long period of time and when figured on the very reasonable average basis of 35 cents per pair it would make the tidy volume of around $350,000 per month on this item alone and without any tap or heel business to go with it. Truly an annual volume of any business amounting to $4,200,000 is nothing to throw away without a sigh. There is no theory in this statement whatever, for this actually happened. Who would have believed ten years ago that rubber heels would reach the present demand. Did the shoe manufacturers encourage them? It is within the memory of most of our readers when shoe manufacturers charged a retailer 50 cents per pair extra if rubber heels were put on when the shoes were made, for, said they, "Leather heels are a standard thing and we have to buy them anyhow but the rubber heels we have to go out and buy specially for this lot of shoes." Now review the situation, the rubber heels go on almost 90 per cent of the shoes made, and leather heels are the exception and not the rule.

So it can be with fiber soles.

Unvulcanized Plantation Rubber Soles

The preparation of plantation sole rubber is the same as for ordinary blanket crêpe as to coagulation, breaking down and drying. After drying, care must be taken to obtain the dense, hard-knit, gristly texture which gives the desired quality for soles. Four times through the mill is sufficient to produce the proper texture, and excessive working tends to soften the rubber. A smooth mill is next employed with rolls set to produce a thickness slightly in excess of one-eighth inch. The whole length of crêpe should be of even thickness throughout and be 15 inches in width.

Next follows building up to required final sole thickness, either exact one-quarter or three-eighths inch. This is done by plying up the sheet stock and passing it through the smooth rolls set to give the correct gage and pressure to ensure perfect union of the plies without breaking up the texture of the rubber. If this operation follows the preceding one closely the warm rubber will knit together permanently. Six or seven times through the mill is sufficient. This completes the process for the smooth sole, one side of which should be as smooth as possible for fixing to the leather and the other side slightly rougher.

Soles with corrugated tread can be produced by laying one strip from the grooved mill together with two strips from the smooth mill and rolling the plies together.

Sheets for smooth soles are 13 by 36 inches, and for corrugated soles it is more convenient to make the dimensions 9 by 26 inches as the corrugations are to run crosswise of the cut sole. The sheets are cut to size by a machine knife on the guillotine principle.

In packing, each sheet is laid evenly, full length in the case without overlapping at the edges, in order to avoid pleats. Each case should be quite full but not pressed. Adhesion of sheets may be avoided by allowing the rolled sheets to remain a few days before packing. On no account should French chalk or other dusting material be used in packing as it will interfere with the action of the solution in applying the soles.

No difficulty is experienced in separating the sheets if they are packed cold and dry.

The important points to observe are not to overdry, overwork or overheat the rubber and to maintain standard dimensions, texture, and color.—J. Farley Elford, Ceylon, in *Bulletin of the Rubber Growers' Association*, August, 1922, pages 361-363.

THE "RED INNERSHU," A REINFORCEMENT TO GO INSIDE OF automobile tires, reaches entirely around and from bead to bead. It is made of fabric woven from the best Sea Island cotton, scientifically treated, and is constructed 3- and 4-ply. It is said to strengthen the tire, prevent the casing from cracking and perhaps pinching the tube, and to be practically blowout and puncture proof. It may be removed and used over again, as some users have found it outwears several tires.—Inner Shoe Tire Co., Grand Rapids, Michigan.

Industrial Management

A Timely Article on the Economic Management of a Rubber Mill

By Arthur T. Hopkins[1]

INDUSTRY is the production and merchandising of goods for profit, and industrial management is concerned in the best methods of dealing with the various steps in this process. We shall divide these steps into six divisions for convenience of discussion.

1. Purchasing, including scheduling, raw material stores and laboratory control.
2. Production, including routing, deliveries, quality, and material and labor costs.
3. Manufacturing economies, including equipment, combustion and steam material, balanced construction and standardization, labor and methods.
4. Personnel, including selection, training, organization, industrial relations and rewards.
5. Merchandising, including stocks, sales policy and manufacturing policy.
6. Finance, including control methods, accounting, costs, credits, working capital and bank relations.

The first step will necessarily be the purchase and control of raw materials. No one in these days of quantity production questions the value of planning before acting; accordingly the first step is to analyze the orders and schedule the material and labor required for the goods. Details will vary greatly according to the proportions of stock and special goods, a subject that will be discussed later. Specifications are necessary for the scheduling of the proper materials and it is obvious that reasonable standardization will reduce the varieties of material and simplify all the following operations.

The actual purchase of materials calls for close cooperation with the manufacturing and finance departments and a close watch of the trend of prices, but generally speaking, the amount of raw materials on hand in the plant should be kept at the lowest practicable figure. The best way to accomplish this is by the use of maximum and minimum standards, revised frequently. Each raw material should be kept separate and stock record cards maintained. This simplifies inventory as well. All requisitions should show money value for purposes of economy.

From the stock record cards it is easy to prepare a monthly statement of dead or slow moving material which should be promptly salvaged, increasing working capital.

No matter how small the factory it will pay amply to have physical and chemical tests on raw materials and samples as received. Such a laboratory need not be expensive, but if none exists, arrangements can be made at some general laboratory. Tests are necessary for intelligent buying and for proper handling of the problems of production, and as a check on the quality of finished goods. Such laboratory control, if not carried to excess, will pay large dividends.

Production

After the raw materials are in store the next step is planning and ordering of work, or routing. Large factories are forced to do this to maintain a reasonable and smooth running ticket, but it is just as essential in a small factory. The planning department decides on the ticket for a certain day and then orders the preparation of the different parts that go to making up the finished article. These are delivered at the proper time at the bench or machine where the assembly or production takes place, and as only enough for the day's work is delivered, there will be no excess amount of goods in process and the available working space will be fully used. Completion of the ticket will mean that the goods can be shipped on a certain date, barring accidents, and consequently promises can be made and kept, and service given to the customer.

The control of quality is a large problem. The first step is the working out of specifications which assure the best product for the money. The aim is a properly balanced piece of goods. For instance, in a piece of hose the fabric should be strong enough to stand the necessary pressure and strain, and of a texture to take the proper friction. The tube and cover should be of a quality to balance the fabric, so that the whole finished article will give reasonable service and will all wear out together like the "Deacon's one-hoss shay."

In making up such specifications, consideration will be given to standardizing on the fewest raw materials that will serve our purpose and also naturally on the fewest and most profitable goods. A study of returned defective goods is very important and helpful in this connection. The matter of waste is very important. Sufficient inspection should take place while goods are being made so errors can be corrected before curing. Final inspection should be such as will insure satisfaction to the customer. Reasonable tolerance should be maintained.

Manufacturing Economies

Material costs in the rubber business are almost always the large costs, and specifications are the controlling factor.

The aim should be not *cheap* goods, but goods suited to the purpose, and there are frequently large economies possible while making a better balanced article. Important in material costs is the matter of waste, and a walk through almost any rubber factory would show unnecessary waste. Many factories carry an inventory of slow moving raw material, unnecessarily large goods in process, and finished goods amounting to 20 to 30 per cent of the working capital, and this material is usually deteriorating. The compound room frequently shows bins of dusty mixed stocks that have not been moved for months.

The best solution for this condition is usually a salvage department into which all dead or slow moving material is placed each month. This will concentrate attention on the problem and lead to a remedy. A weekly inspection and analysis of defective goods rejected in the factory and returned from customers will lead to changes in specification and methods of manufacture. This will lead quickly to reduced costs in many cases of two or three per cent.

Labor costs are an important part of the total cost of goods. Too many small factories are on day work almost altogether because of various reasons: The volume of business may be small; the planning and routing may be poor so that the worker cannot be kept supplied continuously with materials, or in the lack of proper time study of operations; fair rates may not have been set—standard rates should be set on all operations and used in costs and checked with the payroll so as to be sure the labor costs as figured are not exceeded.

Great progress has been made in recent years in reducing labor costs by the design and use of automatic or partially automatic machinery. Such machines make better and more uniform goods usually, and frequently lead to great reductions in labor costs. Tire builders and loading and unloading devices, heel trimmers, hose and belt making machines, and many other devices will occur to us.

An important item of cost is the expense item. This will vary from a total equaling labor cost to twice that amount. The investment in bricks and mortar is usually too large by far and

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a study of proper routing and the use of modern machinery and a reduction in unnecessary inventory will reduce it. The time to do this is when business is rushing and the departments crowded with business. Equipment is rarely used to capacity and heavy machinery like mill room machinery should be run continuously.

A lot of money is wasted in departmental expense. This can usually be cut in half by the establishment of departmental budgets and weekly or monthly reports of the cost of supplies and repairs. It is very helpful to price the requisitions, as the foreman knows the cost of what he asks for.

Another economy often neglected is that of coal combustion and steam. The average factory manager knows he uses a lot of coal, but does not study the problem, when a little thought and care might cut his coal bill in half and cut out that black flag from the top of his chimney stack.

Pipe covering will save money and deliver dry steam to the vulcanizers, preventing a lot of troubles in curing, and the hot water and low pressure steam can be used in various ways and most of it taken to the feed water heater and boilers again.

The methods of manufacture in all departments are worthy of study, and we would suggest a committee of representatives from the operating, cash, laboratory, and mechanical departments to work on goods showing an unsatisfactory margin of profit.

Personnel

Quantity production and the large aggregations of labor have focused attention on labor problems. We have discovered it costs money to hire a man and fire him, and the quicker we fire him or let him fire himself the more it costs, or the smaller returns we get from him.

It costs money to hire him, it costs money to train him or educate him for his job, and it costs money to get the work equivalent to the money we pay in wages. Accordingly a good deal of study has been given to the problem and we will outline briefly what has grown to be good practice.

First, the selection is made by the best qualified person, who in larger plants is the employment manager. He has analyzed the various jobs and knows just what each one is and the sort of person who is needed, so he selects the person best fitted for the job.

Next comes the period of training. There is usually a best and a poorer way of doing everything. Accordingly the effort is made to teach the best way. When the group of workers is large enough to warrant it a school is formed where the new employe is taught the best way of doing the job, and he is kept in the school until he is fitted to go to the department for which he was hired. By this means the best method is taught and the new worker becomes proficient in a very short time, usually half that taken when he learns from his neighbor at the bench.

As most of the labor turnover takes place in the first day and week of employment and is doubtless largely due to unaccustomed surroundings and new work and slowness in learning, it would seem that the proper training and introduction would reduce turnover and this it does in fact. It also leads to improvement in method and this is a very important result.

Where workers are largely non-English speaking, it is frequently advisable to have instruction in elementary English and arithmetic. Workers appreciate good working conditions, clean, well lighted work rooms, good lockers and sanitary facilities, but more than all they appreciate good management, delivery of material promptly and in good condition, good discipline, cheerfulness and courtesy on the part of foremen and fellow workers.

The factory council has proved its value along these lines. We are familiar with a number and it is interesting to note that, of recorded subjects for discussion, working conditions, including delivery and condition of material, far outnumbered all questions of wages. This council is fundamentally a channel of easy communication between the management and the worker and it is equally valuable to each and it is serviceable to each group in proportion to the thought and effort put into it. Above all it will pay to capitalize suggestions made by the workers.

The factory council tends, in the opinion of some foremen, to weaken their power; as matter of fact this does not work out in practice, except in the case of the factory bully. The man who is unjust will find his wings clipped because his methods will not bear discussion. This, however, will be to the material advantage of management and labor, as management will discover a degree of cooperation on the part of the worker which is unexpected.

Foremen's clubs will be found a proper corollary of the factory council and here again results will be proportionate to the effort and any strengthening of the executive personnel will pay good dividends.

The matter of wages and incentives comes in here. This country is doubtless facing a period of labor shortage, so that the basis wage rate for unskilled labor will be fixed by competition.

Rates for skilled labor will be determined by the time taken to acquire skill. There are many different types of bonus or incentive, but it is well to remember that an incentive that is paid or figured daily is correspondingly more effective than one paid weekly or monthly. Most large factories have adopted some type of bonus payment for increased production because of its beneficial effect on overhead or burden. Let us not forget the management major and minor in this arrangement and above all we would emphasize the use of control figures by the foremen. Put the man into business for himself by giving him the material, labor and expense figures for his department and paying him for his efforts in profit making. You are likely to be very pleasantly surprised at the results.

We will not discuss insurance, pension, and stock participating plans. They are all intended to relieve the worker's fear of old age disability and appeal to the older worker. What we believe is more important to the worker, young and old, is an assurance of continuity of work, and this is a problem that industry must solve. It is largely a merchandising problem, and its solution will help greatly in stabilizing labor costs.

Merchandising

Merchandising is the next step in our cycle of industry. Shall the factory produce the goods sold by the sales department or shall the sales department sell the goods produced by the factory? In the first case the goods sold are those in greatest demand which may be due to unreasonably low prices or they cover only such a range of days as handicaps the factory by small orders. In either event profits suffer. In the second case the sales department may be handicapped because of difficulty in satisfying the customer. The answer is close cooperation of the two divisions and a study of the cost sheets and profit and loss statement.

It is certainly true that merchandising calls for the same study and planning that are given to production and that in many cases this call is being answered by a study of unprofitable lines and territory, by a study of lost sales, by a study of prices based on probable sales, and by a close scrutiny of unexploited sales possibilities; but it is fair to state that in most companies we are acquainted with, the largest dividends would come from intelligent and close cooperation of production and merchandising.

Nothing is more important than service to the customer and this is something frequently lost sight of by the production man. We well remember our first visit to an important customer. We thought our deliveries had been pretty good, but on our return to the factory we cut the time of future deliveries in half. Here again we face the importance of a few lines and stock goods instead of specialties, and this cannot be too much emphasized.

On the other hand, the two coordinating departments must be prompt to meet the needs of the trade by developing new lines when worth while. Above all, the emphasis will be on quantity production.

Finance

Finance supplies the funds for purchase and pay-roll and the control figures which assure the profit. Accounting and costs should be closely united. Material labor and expense should be controlled by budget and by periodic reports. Overhead burden should be standardized and spread over as long a period as practicable and everything made as simple as possible. The cost estimating system should be tied in with actual costs of special runs of goods, or checked by running inventory and actual payroll over a period.

Proper credit and collection procedure should be established. Special attention should be paid to keeping working capital as liquid as possible and to frequent turnover. With this end in view there should be as small an inventory of raw materials, goods in process and finished goods as service to the customer will permit. Accounts and bills receivable also demand constant attention.

During the critical period of the past two years, the banks have extended credit to industry, in many cases beyond reason. Those concerns having good banking connections have had reason to be pleased as the shrinkage in inventories wiped out assets till in many cases nothing was left but a good dividend history. Many such institutions have been carried along until they were on their feet. Nothing but sound and friendly relations with the banks has made this possible.

New Development in Colored Hard Rubber

TIME honored secrecy in compounding and other rubber manufacturing processes limited the development of the industry for many years in both hard and soft rubber divisions. Many fixed opinions based on experience have been modified by close analysis and intensive scientific inquiry. A case in point is the view, long accepted as a finality, that hard rubber can be made only black and vermilion red. This close restriction of available colors has been somewhat of a limitation on the uses of hard rubber for purposes where the matter of color is counted important.

The fact that grandfather said hard rubber, in the nature of the case, can be only black or vermilion seemed to settle the point for many years until doubt of the correctness of this view was confirmed by experimental demonstration by an American investigator.

Coloring Soft and Hard Rubber

Color compounding in soft rubber is comparatively easy because the results usually can be foretold. The differing conditions of the curing process afford opportunity to solve the problem by giving a wider range for experiment. Such is not the case in the hard rubber field when the cures have always been both long and at high temperatures to effect saturation of the caoutchouc molecule with sulphur and produce ebonite or hard rubber.

Organic Accelerators

The introduction of vulcanization accelerators affords means for curing rubber not only in less time than formerly but at lower temperatures as well. Experiments in curing with recently developed rubber colors have all been conducted with the aid of accelerators, principally hexamethylene tetramine mainly for reduction in the time of cure. Some accelerators, triphenyl guanadine, for example, seem to influence the tone of the colors but only in hard rubber which is no doubt due to the length and high temperature of the cure.

The shorter period and milder temperatures of soft rubber cure do not influence the permanence of the color effects, in fact colored soft rubber products have been successfully cured for periods as long as eight hours. It is desirable to keep the curing temperature down to 300 degrees F. or below. Therefore the use of accelerators is not vital to the preservation of the color tints at present possible with the new colors.

New Rubber Colors

Color chemists in their laboratories have experimented diligently for a long period on the problem of producing rubber colors that would be fast under the long continued high temperatures of hot vulcanization such as met with in hard rubber work. Their efforts, recently announced, have met with ready acceptance and encouraging success in both the hard rubber and soft rubber fields. A good variety of permanent colors for hard rubber work is now commercially available, and samples of colored hard rubber are shown in ranges of shades of red, maroon, brown, olive green, tan, blue and purple.

New Field for Hard Rubber

The success of these new colors opens to the hard rubber industry a new field for colored staple articles and novelties that have hitherto been made either in black hard rubber or in some other hard plastic unvulcanized material, the nature and process of working which does not impair or destroy organic colors.

Durability of Colored Hard Rubber

Colored hard rubber exhibits all the inherent good qualities of ordinary hard rubber. It does not deteriorate, is waterproof, has high dielectric tensile strength, takes a high polish and allows the use of a great variety of pleasing color combinations suited to many purposes. The colors are all of a light gravity which is an important factor as related to volume cost in piece work production.

The applications of colored hard rubber cover a wide range of possibilities in the field of novelties and ornamental surfaces as well as for radio instrument and automobile parts or even automobile bodies, wainscoting and many other articles.

Judicial Decisions

Appraisers' Decisions

No. 45,367.—Protests 945,501, etc., of Pacific Trading Co. et al. (San Francisco and Honolulu).

RUBBER SPONGE BALLS—TOYS. So-called sponge balls of rubber classified as toys at 35 per cent ad valorem under paragraph 342, tariff act of 1913, are claimed dutiable as manufacturers of rubber at 10 per cent under paragraph 368.

Opinion by SULLIVAN, G. A. The sponge balls in question were held dutiable as manufactures of rubber under paragraph 368. Abstract 44,982 followed.—*Treasury Decisions,* Vol. 42, No. 21, November 23, 1922.

Adjudicated Patents

PAYNTER vs. LEE TIRE & RUBBER CO. United States District Court of Pennsylvania.

The Paynter patent, No. 912,725, claims 1 and 11, for pneumatic tire tread, held not infringed.—*Federal Reporter,* Volume 282, page 624.

Adverse Decisions in Interference

On October 24, 1922, a decision was rendered that Robert M. Pierson was not the first inventor of the subject matter covered by the claim of his Patent No. 59,273, "Design for pneumatic tire tread," assigned to The B. F. Goodrich Co. No appeal having been taken within the time allowed, the decision has become final.

What the Rubber Chemists Are Doing

Physical Testing Graphs[1]

By W. B. Wiegand[2]

THE author here presents a standardized form for exhibiting the results of the commoner physical tests on vulcanized rubber. Two objects have been sought: (1) Optimum arrangement of data, and (2) suppression of nonsignificant variations.

Arrangement

On the left of the chart, against cure in three-minute scale divisions as abscissæ, are shown as ordinates the three quantities, breaking tensile, breaking elongation, and subpermanent set after rupture. These three factors constitute what may be called the classic group of physical criteria.

In the right upper quadrant are the stress-strain curves with elongation as abscissæ and original (left-hand) tensile scale as ordinates. In the lower right quadrant are energy of resilience and tensile product on an upright scale against a replica of the curing scale shown at the left.

Coming to the choice of scale, I wish first to defend plotting the tensiles as ordinates, instead of as abscissæ. The latter method is quite common on the continent, and is also used by some on this side. In general the equation $y=f(x)$ is, I think, universally plotted with values for y as ordinates, and those for x as abscissæ. That is, the independent variable is laid horizontally, and the dependent variable vertically.

In rubber testing on this continent, by far the commonest machine is that of the type of the Scott tester, where stress-strain curves are obtained by making the elongation the independent variable, and measuring the corresponding tensile. It therefore would seem most consistent to lay these fixed parameters horizontally. The same argument of course, applies to curing curves, where the cure is invariably laid horizontally, and the elongations now become the dependent variable, and so are plotted vertically.

The question arises as to whether the opposite method has any practical advantages which more than compensate for its irregularity. I understand that the Schopper testing machine records tensiles horizontally and elongations vertically, but the graph thus obtained runs to the left instead of to the right, so that even the Schopper diagram has to be rotated through 180 degrees to bring it into the standard form.

I submit that it should be no more trouble for those who use Schopper machines to make the 90-degree rotation necessary to bring their curves into agreement with the method here advocated. I believe it is also true that in the case of those who use Schwartz and Breuil testing machines it would be no extra work on their part to exhibit their curves in this manner, which is standard in engineering practice.

From the standpoint of hysteresis loops, the use of a vertical tensile scale brings the figures into harmony with those used by engineers in connection with magnetic and other hysteresis phenomena. From the standpoint of energy of resilience, which is measured by the area subtended by the curve, it is common practice everywhere to show forces as ordinates and lengths as abscissæ. It is an interesting fact that when engineers do physical tests on metals, they arbitrarily fix the load and measure the extension, and yet they are quite willing to plot their curves with tensiles upright to bring their results into line with the general practice.

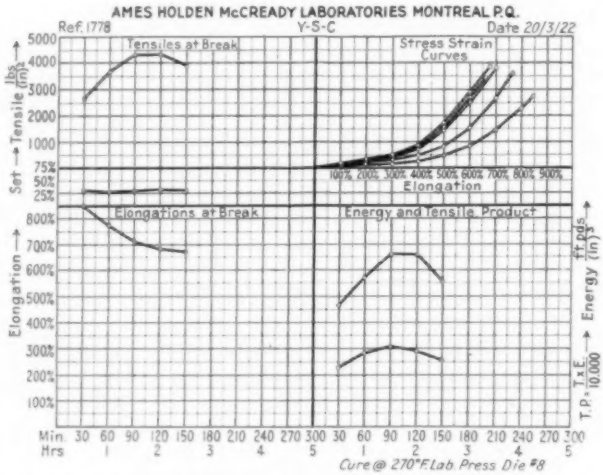
Thus, on the left side, tensiles are shown to 5,000 pounds per square inch, subpermanent set at break to 75 per cent (of the original length between bench-marks), and elongations to 850 per cent (and more, by a slight encroachment upon the "set" area).

[1]Paper read at Spring Meeting, 1922, American Chemical Society, Birmingham, Alabama.

[2]General Manager, Ames Holden McCready Limited, Montreal, Quebec.

Suppression of Non-Significant Variations

Coming to the suppression of nonsignificant variations, scale divisions run twenty to the inch with half-inch squares. This corresponds to 100 pounds per square inch in tensile to each scale division, 5 per cent of subpermanent set to each division, and 10 per cent elongation to each division. I have chosen these values as corresponding to the error inherent in rubber testing as ordinarily carried out. I think no one would attach serious significance to the difference between two stocks, one of which shows 3,000 pounds tensile strength and the other, 2,900. Using bench-marks one or two inches apart, and with ordinary refinement in marking, elongations cannot practically be determined closer than 10 per cent absolute value. Subpermanent set values differing by


AMES HOLDEN McCREADY LABORATORIES MONTREAL P.Q.
Ref. 1778
Y-S-C
Date 20/3/22
Tensiles at Break
Stress Strain Curves
Elongation
Elongations at Break
Energy and Tensile Product
Set → Tensile (lbs.)
Elongation →
T.P. = T x E / 10,000
Energy (in.)² → ft. pds.
Min. 30 60 90 120 150 180 210 240 270 300 30 60 90 120 150 180 210 240 270 300
Hrs 1 2 3 4 5 1 2 3 4 5
Cure @ 270° F. Lab. Press Die #8

Proposed Standard Chart for Recording Physical Rubber Tests

less than 5 per cent are not in our experience significant. Again as to the curing scale on the X axis, a 5-hour curing range with a 3-minute unit of division has turned out to be of sufficient refinement for most technical work.

For work in connection with ultra accelerators where the cures are cut down to one minute, the figures showing the hours can be used as minutes. For general factory purposes, however, it is hardly likely that large-scale operations will ever be carried out with compounds depending for proper vulcanization on curing intervals of less than three minutes, this by virtue of the natural limitations due to thickness of stock and lag in temperature.

Assuming that the lines used in graphing may run up to 1/20-inch in width or at any rate that the circles marking the determinations are of that diameter, we see that differences in tensile, set or elongation shown on the chart indicate, under favorable conditions, *significant* differences in the rubber tested, and conversely one is not called upon to interpret irregularities in the trend of a line which in all likelihood represent only errors of technique.

The choice of this scale in no sense obscures genuine variability, nor on the other hand does it obscure errors in testing due to inaccurate compounding or curing, etc. It only submerges such errors as come within the range of accidental error inherent in the testing machinery under the very best of conditions.

Stress-Strain Curve Plotting

The same unit scale divisions as apply at the left side of the chart apply also to the stress-strain curve, the effect is apparently

to shrink the scale of stress-strain curves below what one might at first regard as a desirable limit. It is common practice to display huge open-scale stress-strain curves, but our experience has been that considerable useless speculation can be obviated by shrinking the scale to a point where only significant differences appear. For example, in the case of flat curing compounds, it is quite common for a series of cures to result in curves which, on this scale, overlap to form an almost solid line. In our opinion, this overlapping is really essential to clarity of interpretation, corresponding as it does to the facts.

Progression and regression of the stress-strain curve appear on the chart only when they are of a magnitude greater than that of the experimental error of the determinations. The moment a series of curves overlap to form a single line, the graph tells us that we need suspect no significant displacement with advancing cure. Areas under the stress-strain curve can be conveniently determined by the method of additive tensiles or by counting the squares, or very accurately by the planimeter.

In the lower right quadrant is shown energy of resilience and tensile product of the same scale, extending up to 800 units. The two scales are combined because these two quantities do not commonly overlap, this by virtue of their conventionally accepted units. One division in the energy scale corresponds to ten foot-pounds per cubic inch of rubber, and one division also equals ten units of tensile product as defined in the right hand margin. These units also were carefully selected to achieve suppression of accidental error. For example, an error of one scale division in tensile strength, combined with an error of the same extent and kind, in elongation, produces an error of approximately one scale division in the tensile product.

Such a suppression of accidental error is of distinct value in estimating optimum cures. When a curve in any of these quadrants shows upward convexity, it is attributable to actual optima in the properties. Moreover, the convexity is neither exaggerated nor minimized, so that the effect of a given variation in time of cure can be properly assessed as to its effect on the properties of the product.

Application of the Chart to Selection of Optimum Cures

For the purpose of accelerator research, where a definite criterion of speed of cure is desirable, the apex of the tensile product curve would probably be the choice of most workers. This would be determined from the lower right quadrant. The choice of an optimum cure in the technical sense would in general be a totally different procedure, depending on the type of compound, grade of compound, conditions of service, etc.

The old method of observing the trend of the tensiles at break in relation to the subpermanent set and to the breaking elongation, all three being plotted against the time of cure as on the left half of the sheet, still has much to recommend it. For press-cured samples, subpermanent set might be regarded as a not very useful adjunct to this series, but for dry heat footwear compounds, particularly for use in uppers, also tubes, the choice of a technical optimum often leans strongly towards the undercured side, and in such work we have found the consistent study of subpermanent set extremely valuable.

The onset of reversion, that most treacherous of technical problems, may be clearly recognized by an examination of the left-hand series of data, without reference to the stress-strain curves at all. Thus, a markedly downward sloping tensile curve combined with an upward sloping set and elongation curve, clearly marks the reversion phenomenon. Confirmation of this is of course desirable, and is had by reference to the upper right quadrant.

Stress-strain curves, however, cost money, and our experience has been that a large proportion of the laboratory control of factory stocks can be sufficiently well carried out by filling in only the left half of the chart. For research work, all four quadrants are needed, and, other data as well, such as conductivities, hardness, etc., which are not provided for in this chart.

Application of Chart to Compounding Research

Where the compound is varied, we simply use the X axis by replacing time of cure by volume percentage of pigment, grade or fineness of pigment, etc., using the value for tensile, elongation, etc., that belong to the optimum cure for each compound.

The energy curve which for changing cures usually follows very closely the tensile product curve, and so offers little assistance in the selection of optimum cure, becomes of paramount importance in the determination of *optimum loading* or the comparison of one pigment with another. This energy factor is indeed being gradually adopted on both sides of the Atlantic as perhaps the most complete single measure of toughness or general "tone" of a stock.

Thus while for curing tests the left half of the chart suffices in many cases, for work on compounding ingredients, the right half is perhaps the more important.

This brief account of one method of combining the results of the commoner tests into a single picture is offered in the hope of stimulating thought along the line of securing greater uniformity in the representation of such results and of facilitating comparison.

Chemical Patents

The United States

HEALING COMPOSITION. A puncture closing composition for inner tubes which solidifies on being forced out through a puncture.—George Alstädter, Vienna, Austria. United States patent No. 1,434,764.

PROCESS OF MANUFACTURING VULCANIZED RUBBER. Slabs are built up of sheets of rubber containing alternately sulphur and accelerator.—M. M. Harrison and Harold A. Morton, assignors to The Miller Rubber Co., all of Akron, Ohio. United States patents No. 1,434,892 and 1,434,908.

RUBBER VULCANIZATION. Method of accelerating vulcanization consisting in mixing with the rubber compound tertiary amylamine.—Harold A. Morton, Akron, Ohio. United States patent No. 1,434,909.

RUBBER-LIKE MATERIAL. The gummy matter derived from the Yucca plant by distillation is mixed with sulphur, asphaltum and Pará rubber by melting and the resultant product is dried and oxidized.—John C. Wichmann, Los Angeles, California. United States patent No. 1,435,359 and 1,435,360.

PHENOLIC RESIN PRODUCT.—Alexander Blumfeldt, assignor to Society of Chemical Industry in Basle, Basle, Switzerland. United States patent No. 1,435,801.

CLUTCH FACING AND PROCESS OF MAKING. A shaped body of hardened mixture of asbestos fiber, a resinous condensation product and rosin.—William C. Fisher, assignor to The Russell Manufacturing Co., both of Middletown, Connecticut. United States patent No. 1,436,158.

RUBBER PAINT. Rubber dissolved in oil and subjected to heat treatment is used as a paint vehicle.—Sidney R. Trevor, Sulphur Beach, Auckland, New Zealand. United States patent No. 1,436,736.

ACCELERATOR FOR VULCANIZATION. An accelerator for rubber vulcanization is obtained by oxidizing an insoluble metallic salt of a secondary amine previously condensed with carbon bisulphide.—Paul I. Murrill, Plainfield, New Jersey, assignor to R. T. Vanderbilt Co., Inc., New York, N. Y. United States patent No. 1,436,894.

COMPOSITE PLATE. A composite plate consisting of layers of fibrous material, shellac and phenolic resins compacted and hardened by pressure and heat.—George R. Cox, Jersey City, New

Jersey, assignor to Westinghouse Electric & Manufacturing Co., Pittsburgh, Pennsylvania. United States patent No. 1,437,094.

The Dominion of Canada

RUBBER RECLAIMING PROCESS. Treatment of waste vulcanized rubber with heat in a bath of infusion of Roman camomile and rectified castor oil.—Eugene Hug, Paris, France. Canadian patent No. 225,293.

PERMEABLE SHEET MATERIAL. A calenderable mix is made of rubber composition, quick-curing ingredients, fibers, a softening agent, and a liquid non-solvent of rubber. The calendered material is heated to expel vapors of the non-solvent liquid and form minute passages through the sheet, and finally vulcanizing the sheet completely.—The Canadian Consolidated Rubber Co., Limited, Montreal, Quebec, assignee of Willis A. Gibbons, New York, N. Y., and Herman W. Ritter, South River, New Jersey. Canadian patent No. 225,653.

The United Kingdom

RUBBER PAVING. An elastic compound for hard tennis grounds, skating rinks, etc. Consisting of ground cork, finely cut rubber, and copper dust or filings mixed with cement and sand or with bitumen, tar, etc., and stone chippings.—A. D. Thompson, Bushey, Hertfordshire, and A. H. Bird, Harrow Weald, Middlesex. British patent No. 185,838.

SYNTHETIC RESINS. Resinous products are obtained by heating in definite proportions phenols and sulphur in the presence of a base.—O. Y. Imray, 30 Southampton Buildings, Holborn, London; Society of Chemical Industry in Basle, Basle, Switzerland. British patent No. 186,107.

REPAIR RUBBER. A rubber composition vulcanized by heat, containing 30 to 40 per cent of solvent to produce an adhesive capable of extrusion from a collapsible tube, but which will retain any shape to which it is molded.—W. Frost and Frost & Co., Ltd., 148 Great Portland street, London. British patent No. 186,709.

Germany

Patents Issued, with Dates of Issue

362,667 (January 1, 1920) Accelerating the vulcanization of rubber and the like. The North British Rubber Co., Limited, Edinburg, Scotland; represented by Dr. Döllner, Seiler and Maemecke, Berlin, S. W. 61.

365,626 (October 12, 1920) Preparing insulating masses from the condensation products of phenols and aldehydes. Felten & Guilleaume Carlswerk A.G., Köln-Mülheim.

COLLOIDAL CRIMSON ANTIMONY

This well-known rubber pigment is now supplied in paste form mixed with 33 per cent of paraffine. Since the paste softens at 143 to 160 degrees F. it should be added to the rubber in paste form which can readily be done.

The coloring power of the paste is the same as that of the same amount of antimony without paraffine. It has the advantages of mixing quickly, uniformly, and without loss. One unit of paste containing 75 per cent of antimony is equivalent to one part of pure or 100 per cent antimony.

The antimony paste remains constant against the influences of light, oxidation, sulphur chloride, and bleaching by steam.

SATURATING AND FINISHING WAXES

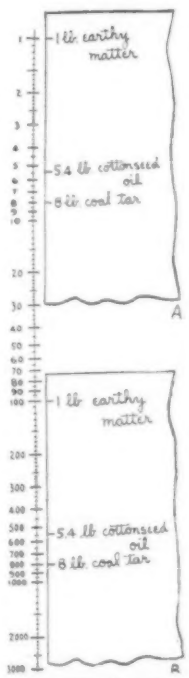
Special saturating wax is used in the manufacture of insulated wire to give a soft finish to the braid and to increase the insulating properties of the product. Essential features of saturating wax are that it should be absorbed by the rubber insulation to less than one-half of one per cent and possess light specific gravity to give economy in use.

Finishing wax is employed to give a waxy black finish to the braided wire that will not check or crack in service and will meet the new code wire and melting point requirements.

Proportioning Scale for Rubber Compounders

By N. G. Near

The proportioning scale here shown will be found convenient for multiplying or dividing any formula by rubber manufacturers and others who must frequently use formulas in making mixtures or combinations of any kind.



Compounding Scale

To use the scale lay a slip of paper alongside it in position A and then on the slip indicate the proportion of each ingredient in the formula, just as has been done here. For example, the formula scaled is 1 pound earthy matter, 5.4 pounds cottonseed oil and 8 pounds coal tar. This formula is typical of problems that may be solved easily on the chart.

If it is required to multiply this formula by 100 simply move the slip of paper down to position B so that the 1 pound earthy matter falls opposite 100 on the scale. The results can then be read off: 100 pounds earthy matter, 540 pounds cottonseed oil and 800 pounds coal tar.

A very simple case has purposely been used here merely to show how to use the chart. The value of the scale will become more evident to the user when it is applied to formulas involving fractional amounts and when the formula is to be multiplied by 97, 76, or any odd number that would be handled with greater difficulty mentally than when multiplying by 100.

The number of elements, chemicals, or compounds in the formula makes no difference in the use of the chart. The greater the number and complexity of the formula the greater the value of the chart to the user.

To divide the formula or to make the amount smaller the method is the same as described above, with the exception that the slip is moved upward. The proportions are always the same no matter where the slip is placed.

MALATEX

Malatex, indicating latex from Malaya, is a pure plantation Hevea rubber latex of known source with a guaranteed minimum of 30 per cent dry rubber preserved with ammonia, an anti-coagulant of recognized efficiency.

S. A. E. TO HOLD ANNUAL MEETING

Coinciding with the week of the National Automobile Show will occur, January 9-12, the annual meeting of the Society of Automotive Engineers, Inc., 29 West 39th street, New York, N. Y. A program of much interest has been prepared, the various technical sessions being all held in the Engineering Societies Building, at 29 West 39th street. The morning meetings will start promptly at 9.30, one-half hour earlier than in previous years. The afternoon meetings will begin at 2, and the evening meetings at 8 o'clock.

The society's annual dinner to be held at the Hotel Pennsylvania, on the evening of January 11, has always brought out a representative group of men prominent in the automotive industry.

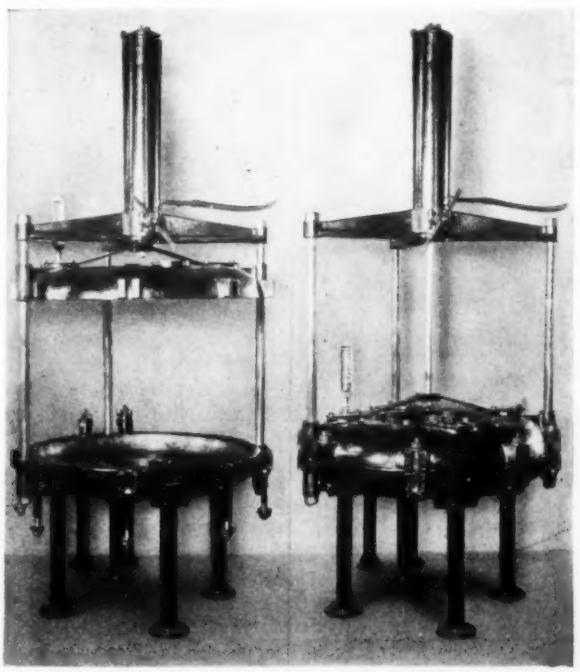
New Machines and Appliances

Individual Tire Vulcanizer

A NEW development in individual tire vulcanizers is here shown. This machine is not to be confused with the steam-jacketed mold but is a separate vulcanizer built to receive various sizes of molds within a certain range. The molds, however, must be turned on the outside to fit properly in the vulcanizer.

The upper and lower halves of the mold are attached by bolts to the corresponding sections of the vulcanizer. No bolting lugs are required on the mold as this is held together by the vulcanizer bolts.

In operation the upper halves of the vulcanizer and attached mold are raised on guide rods by an overhead air hoist a distance of 30 inches, to allow making space for handling the tire in and out of the mold. As the mold remains in the vulcanizer, the tire with its airbag is the only thing to be handled, thus saving the arduous labor of handling heavy molds in and out of the heater. The vulcanizer can be opened and the tire removed in a few



OPEN CLOSED

Utility Tire Vulcanizer

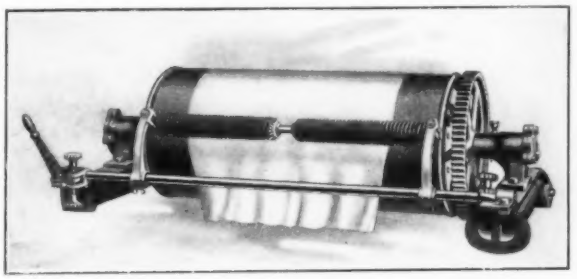
seconds, thus obviating the need of using cooling water, and no hydraulic power is required.

This machine is built in three sizes to cover the range of tire dimensions from 30 by 3 to 37 by 8. Airbag molds that take tires of these respective sizes can be fitted to the machine.—Utility Manufacturing Co., Cudahy, Wisconsin.

Machine for Stretching and Removing Wrinkles in Fabrics

The processes of drying and frictioning fabrics inevitably cause them to lose width or become wrinkled. This is particularly true of such materials as breaker fabric, square-woven goods and stockinette. Breaker fabric is one of the most difficult materials to handle, especially before the first friction coating, because it has a tendency to reduce about 12 inches in width and distort the weave accordingly. Similarly in winding up the coated fabric, wrinkles and loss of width frequently occur.

A very effective bristle stretcher and wrinkle remover which obviates these losses is shown in the accompanying illustration.



Birch Fabric Stretcher

The roller brush is built up to required length on a central shaft by individual removable disks containing stiff bristles set at an angle. This setting of bristles gives to each disk a conical or disked form. The inclination of the bristles each way from the center of the roll gives a widthwise stretch to the fabric because each bristle catches a different thread of the fabric at the same time. This has the effect of pushing the cloth outward from the center toward the selvage without undue strain, as the action of the bristles working in unison is absolutely uniform, and their perfect flexibility eliminates all possibility of disturbing the finish of the goods.—Mansfield Machine Shops, Mansfield, Massachusetts.

Full Circle Adjustable Tire Retreader

A steamless, full-circle adjustable retreader is shown in the illustration. The system of retreading embodies the use of sand bags and a mold consisting of a series of small sections ingeniously arranged to interlock with each other, thus fitting any size tire from 30 by 3½ to 37 by 5.

The outstanding feature is that these molds automatically conform to the shape of the tire in contrast with molds cast in long sections. By making the mold fit the tire rather than the tire fit the mold, all separation of the fabric or cord plies is avoided.

R. F. C. Retreading Molds

The sandbag system, combined with a perfected automatic clamping arrangement, assures uniform heavy pressure on all parts of the tire.

It will be noted that the full circle of the tire is retreaded at one operation, being heated within a sheet metal vulcanizing oven which contains three tires at one time.—The Rubber Fusing Co., 37-39 William street, Newark, New Jersey.

Device for Holding Calender Knives

The old familiar yet unsatisfactory method of tensioning calender knives against the middle roll by means of a rubber band, cut from an old inner tube, need no longer be tolerated. In its stead the knife holder pictured here fills every requirement.

Calender Knife Holder

This device attaches by a stop stud in the ordinary knife block. It holds the knife securely and firmly by adjustable spring tension. It is easier and quicker to adjust and release than a rubber band and in every way more satisfactory.—Rubber Engineering Co., Akron, Ohio.

Portable Electric Elevator

Rubber and other manufacturers and storehouse men will appreciate the convenience and economy of the telescoping portable elevator here pictured. They are built for hand power or electric motor drive and in various forms for special requirements. In their design four basic principles of construction are embodied. These are: (1) dependable stability; (2) access from three sides; (3) automatic floor lock; and (4) the framework of every machine is structural steel properly proportioned for the work to be done.

Machine to Tier Tote Boxes

The advantages obtained by installing this portable warehouse and storage elevator are the elimination of inefficient manpower and liability to personal accidents and the gain in economy of storage and shipping space. Cases, barrels, bags, bales, rolls, etc, can easily be stacked ceiling high by an operator single-handed. Handpower machines have capacities up to 1,500 pounds and electric power up to 5,000 pounds.—Economy Engineering Co., Chicago, Illinois.

Welded Metal Stock Shell

The picture here shown represents a durable, reinforced, sheet metal stock shell for calender and cutting room use.

In the construction of these shells no rivets, screws or bolts are used. All attachments are welded. The shell is built sufficiently rugged to obviate stripping out of the heads by mandrel bars, or buckling of the walls by calender tensions or weight of fabric. The interior supports are of truss construction to supply necessary support to the walls. They are also perforated

Paragon Stock Shell

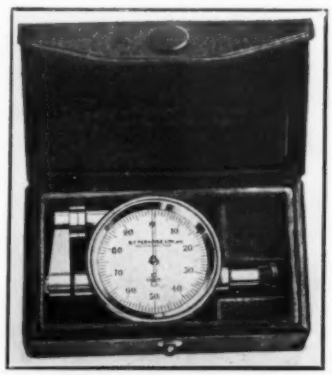
to permit ventilation of the shell and aid in cooling the stock.—The Paragon Equipment Co., Cleveland, Ohio.

Pocket Gage for Rubber and Fabrics

A handy and accurate pocket gage for measuring thickness of rubber, fabric, paper or other sheet material, can be carried in the vest pocket, complete with case as here illustrated.

The dial is 1⅜ inches in diameter, graduated in thousandths of an inch, and half-thousandths can be accurately estimated. The jaws open to more than 300 thousandths of an inch, the pointer going three times around the dial.

For easy and quick reading this instrument has marked advantage over the usual screw micrometer gage.—B. F. Perkins & Sons, Inc., Holyoke, Massachusetts.



Pocket Thickness Gage

Machine for Cutting Irregular Shapes

A machine tool of special construction is here pictured adapted for rapidly cutting sheet iron, celluloid, bakelite, vulcanized fiber, hard rubber, and other materials, by a process of "nibbling."

The Campbell "Nibbler"

It will cut at an average speed of 18 inches a minute. The feed is governed by a small stop-pin on the extreme end of the punch. The piece is fed against this pin, allowing a small portion of the stock to be removed with each stroke of the punch.

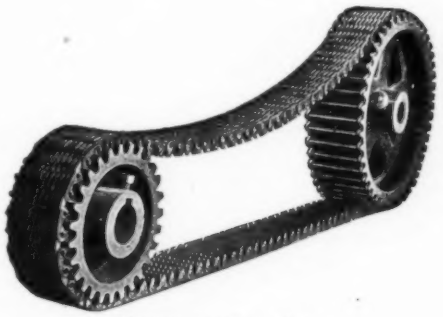
The punches are made of special tool steel, correctly tempered and ground to size. They are double ended and may be inserted in the ram, minimizing tool costs. The machine was designed to take the place of the ordinary type of circle shear which leaves a burr whereas this machine leaves the material flat. In rubber factories it will be useful in cutting gages, templates and patterns.—Andrew C. Campbell, Inc., Waterbury, Connecticut.

High Speed Chain Drive

The chain represented by the illustration is a special development for motor drives on short centers, and similar conditions at high rotative speeds, and where quiet operation is desired. Chain

drive is more flexible than gearing and takes less space than a belt drive.

This chain consists of high grade heat-treated steel links, assembled continuously on pins, meshing into the teeth of sprockets

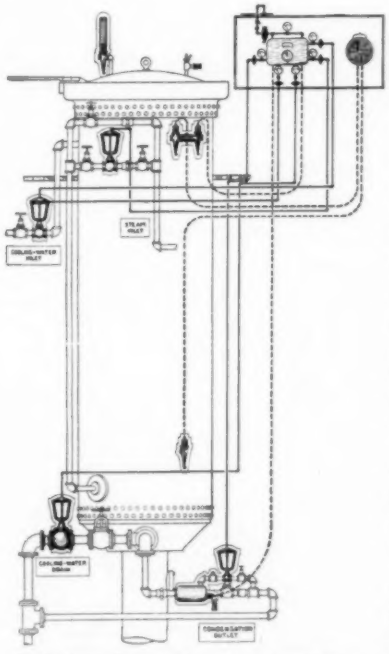


Dodge Toothed Chain

which are similar to spur gears.—Dodge Sales & Engineering Co., Mishawaka, Indiana.

Automatic Press Vulcanizer Controller

The latest development for the automatic control of vulcanization is that represented here which shows the apparatus as installed for regulating the operation of a tire press vulcanizer.



Tagliabue Tire Vulcanizer Controller

This perfected system, besides regulating temperature, condensation and time, provides automatic control of the admission and discharge of cooling water. It may be arranged for presses where the water pressure is either more or less than the pressure within the heater.

When the water pressure exceeds the pressure within the heater the following regulation is typical.

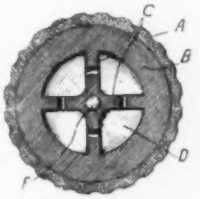
During curing and cooling periods the steam inlet is controlled by either an adjustable, semi-adjustable or fixed cam and the condensation outlet is controlled in unison during the curing period. The steam inlet is closed and the condensation outlet is closed also, both simultaneously, at the end of the curing period and then the cooling water inlet is opened for any desired, adjustable, length of time. The cooling water drain is opened next at any, adjustable, time desired subsequent to the opening of the cooling water inlet. The cooling water inlet is closed finally at the end of the time period set and the clock mechanism is stopped also.

When the controller is reset for the next cure, the cooling water inlet is kept closed; the cooling water drain is then closed; the condensation outlet is opened; the steam inlet is opened; and the clock mechanism is started.—C. J. Tagliabue Manufacturing Co., Brooklyn, New York.

Machinery Patents

Pneumatic Golf Ball

The golf ball here shown is claimed to combine, by its construction, maximum resiliency under driving conditions, and maximum rigidity when putted.



Hollow Center Golf Ball

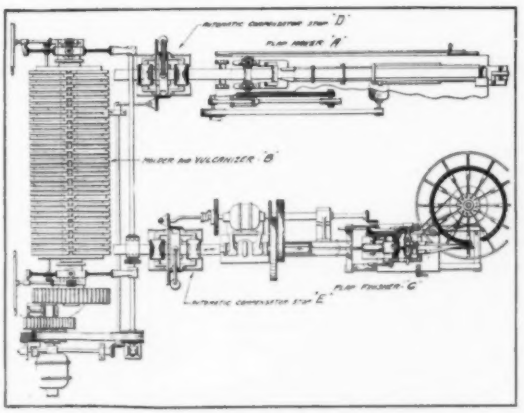
The usual outer cover is represented by A. An inner wall B is designed to produce a high degree of resiliency. To render the ball rigid to light impact without materially reducing its resiliency under heavy impact, radial resilient pillars of rubber C provide the requisite degree of stiffness to the walls A and B. To avoid compression of air under impact in chambers D, holes are provided through C. In the center of the ball a metal ball E permanently is located for increasing the ball weight as desired.

The central section of the ball may be molded in halves and subsequently be vulcanized together before application of the outer covering.—Augustus S. Chatfield, New York, N. Y. United States patent No. 1,426,712.

Tire Flap Molding Machine

The arrangement of the mechanisms indicated in the illustration constitutes an operable combination between a device A for initially forming tire flap stock, the molding and vulcanizing machine B, and a device C which finishes the molded product by cutting it to gage and performing other operations upon it.

The stock having been mechanically formed from rubberized fabric into a belt-like strip by the flap maker A, passes through a device D between A and B, termed an automatic compensator stop, and automatically stops element B when it has drawn up all the stock that has been prepared by A, thus avoiding breaking the flap when shortage occurs. The flap stock is threaded progressively over and under the vulcanizer drums of B and confined



Tire Flap Builder

therein by circulating pressure chains. The revolving drums deliver the molded vulcanized stock to the element C through a second and similar compensator E, which has a like functional relation as between B and C.—Robert McClenathen, assignor to Kelly-Springfield Tire Co., both of Akron, Ohio. United States patent No. 1,427,217.

Other Machinery Patents

The United States

1,434,407 Apparatus and method for making water bottles. C. J. Randall and E. C. Pierce, Naugatuck, Conn., assignors to The Goodyear's India Rubber Glove Manufacturing Co., a Connecticut corporation.

1,434,431 Steam connection for collapsible tire cores. C. H. Desautels, Springfield, assignor to The Fisk Rubber Co., Chicopee Falls—both in Mass.

1,434,567 Collapsible tire core. C. L. Smith and E. S. Webster, assignors by mesne assignments to Smith One Heat System—all of South Bend, Ind. Continuation of application Serial No. 286,117, filed March 29, 1919.

1,434,675 Device for facilitating the cutting of adhesive plasters. U. S. Boone, St. Louis, Mo.

1,435,020 Mold. H. Nye, Akron, O.

1,435,091 Tube-wrapping machine. W. C. Stevens, Summit County, assignor to The Firestone Tire & Rubber Co., Akron—both in Ohio.

1,435,279 Retreading vulcanizer. J. W. Clark, Evanston, Ill., assignor by mesne assignments to H. K. Wheelock.

1,435,616 Rubber masticator. C. C. Mosher, Lima, O.

1,435,659 Apparatus and method for making sheet rubber. F. T. Roberts, Cleveland, O., assignor to Paramount Rubber Consolidated, Inc., Philadelphia, Pa.

1,436,695 Inner tube tester for pneumatic tires. L. F. Burke, Detroit, Mich.

1,435,895 Apparatus and method for building tires. C. G. Hoover, assignor to The Goodyear Tire & Rubber Co.—both of Akron, O.

1,435,904 Tire valve repair tool. H. P. Kraft, Ridgewood, N. J.

1,435,924 Tape guiding, feeding, and cutting attachment for sewing machines. T. B. Huestis, Bristol, R. I., assignor to National India Rubber Co., a Rhode Island corporation.

1,435,970 Expansible tire vulcanizing core. A. B. Merrill, Akron, O., assignor to The B. F. Goodrich Co., New York, N. Y.

1,436,041 Pressed steel tire repair vulcanizer. F. E. Holcomb, assignor of ½ to The Williams Foundry & Machine Co.—both of Akron, O.

1,436,612 Tire bead building machine. H. D. Stevens, assignor to The Firestone Tire & Rubber Co.—both of Akron, O.

1,436,941 Press for making plastic products. A. Burckard, Brooklyn, N. Y., assignor to Pathé Frères Phonograph Co., a Delaware corporation.

1,437,117 Gage for calendered rubber stock. E. D. Putt, assignor to The Firestone Tire and Rubber Co.—both of Akron, O.

The Dominion of Canada

225,170 Loom for weaving cord tire fabrics. The Jenckes Spinning Co., assignee of F. C. Hall—both of Pawtucket, Rhode Island, U. S. A.

225,370 Machine for building up tire casings. The Fisk Rubber Co., Chicopee Falls, assignee of T. Midgley, Hampden—both in Mass., U. S. A.

225,375 Apparatus for treating selvage. The Goodyear Tire & Rubber Co., assignee of M. A. Replogle—both of Akron, Ohio, U. S. A.

225,486 Apparatus for covering the endless wires of tires. J. Healey, W. & A. Bates, Ltd., Bradford, Manchester, assignee of J. Healey, Leicester, Leicester—both in England.

225,519 Tire mold. S. M. Jackson, assignee of A. R. Thompson—both of Tacoma, Wash., U. S. A.

225,640 Sectional tire core. K. O. B. Textorius, New York City, U. S. A.

225,651 Apparatus for mounting tires on sealing rings. The Canadian Consolidated Rubber Co., Ltd., Montreal, Que., assignor of H. V. Lough, Hartford, Conn., U. S. A.

225,654 Device for removing tires from molds. The Canadian Consolidated Rubber Co., Ltd., Montreal, Que., assignee of R. N. Van Buskirk, Detroit, Mich., U. S. A.

225,660 Tube vulcanizer. The Ibex Rubber Corporation, Jersey City, N. J., assignee of M. W. Atcheson, Hartford, Conn., Administratrix of estate of R. H. Atcheson, deceased—both in U. S. A.

225,782 Slitting and rewinding machine. The Cameron Machine Co., assignee of J. A. Cameron and G. B. Birch—all in New York City, U. S. A.

The United Kingdom

185,499 Machine for pressing rubber soles to shoes. British United Shoe Machinery Co., Ltd., Union Works, Belgrave Road, Leicestershire; United Shoe Machinery Corporation, 205 Lincoln street, Boston, U. S. A.

185,846 Machine for treating rubber, etc. F. Niblock, Plantation House, Singapore, Straits Settlements. Refers to Specification No. 113,876.

185,906 Apparatus for painting golf balls. G. W. Impey, 6 Florence Road, Boscombe, Bournemouth.

186,486 Apparatus for vulcanizing two sheets of rubber simultaneously. H. Hawthorn, 16 Upper Gloucester Place, and H. A. Huntley, 28 Budge Row, Cannon street—both in London.

186,585 Airbag. Goodyear Tire & Rubber Co., 1144 East Market street, assignee of R. S. Burdette, 345 Sumatra avenue—both of Akron, Ohio, U. S. A. (Not yet accepted.)

186,618 Repair vulcanizer. J. Haelg, 242 calle de Mallorca, Barcelona, Spain. (Not yet accepted.)

186,693 Mold for tires. M. Greenspan, 112 North La Salle street, Chicago, Ill., U. S. A.

New Zealand

47,618 Milking-machine rubber inflations ring-inserter. The Simplex Milking Machine Co., Ltd., assignee of R. W. Stent, 5 St. Hill street—both of Wanganui, N. Z.

Germany

Patents Issued, with Dates of Issue

362,339 (April 6, 1922) Apparatus for vulcanizing tire tubes. Max Pohl, Schützenstrasse 3, Görlitz.

362,479 (October 28, 1921) Comb-cutting machine. Firma Fritz Clausner, Nürnberg.

362,410 (February 25, 1921) Tool for introducing sockets into thin elastic tubes. Ewald Goltstein, Argelanderstrasse 17, Bonn.

365,409 (June 29, 1920) Apparatus for putting rubber tires into vulcanizing molds. The Dunlop Rubber Co., Limited, London; represented by R. H. Korn, Berlin, S. W. 11.

366,803 (August 1, 1920) Hose coupling. Henry J. Fitzpatrick, Athens, Georgia, U. S. A.; represented by Dr. Warschauer, Berlin, S. W. 61.

366,804 (March 12, 1921) Apparatus and method for making packing U-shaped in cross-section. Thomas Crassett, Brooklyn, New York, U. S. A.; represented by Paul Muller, Berlin, S. W. 11.

Design Patents Issued, with Dates of Issue

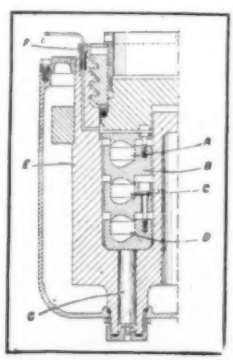
826,168 (August 22, 1922) Vulcanizing mold. Fleming & Cie, G. m. b. H., Charlottenburg.

826,344 (April 15, 1921) Tube and hose coupling. Ernst Zander, Offenburg, Baden.

Process Patents

Producing Spongy Rubber

Spongy rubber is produced by vulcanizing a mixing subjected to gas under pressure. The rubber is subdivided into particles, threads, plates, etc., as thin as possible to facilitate the permeation of the mass by the gas.



Sponge Rubber Press

Finely divided rubber is placed in molds A, B, C, D, and compressed in an autoclave E, and gas under pressure is admitted at F to permeate the mass. When the mass is partially vulcanized mechanical pressure is applied to the molds by the ram G to cause the rubber particles to cohere, and the vulcanization is completed.

The mechanical pressure is removed and then the gas pressure, allowing the gas entrapped in the pores of the rubber to expand and form cells. By mixing powders, threads, etc., of different colors, variegated effects may be obtained.—F. Pfleumer, 48 Marienstrasse, Dresden, Germany. British patent No. 184,468. (Not yet accepted.)

Other Process Patents

The United States

1,435,218 Applying washers to rubber heel molds. H. A. Denmire, assignor to The General Tire & Rubber Co.—both of Akron, O.

1,435,526 Forming hard rubber articles. J. F. Johnston and G. W. Bulley, assignors to The Miller Rubber Co.—all of Akron, O. Original application divided.

1,435,636 Making rubber footwear. A. A. Glidden, Watertown; T. E. La Fayette, Wellesley; and J. J. Gaughan, Cambridge, assignors to Hood Rubber Co., Watertown—all in Mass. Original application divided.

1,435,735 Attaching rubber and leather heels to shoes. G. F. Quinn, Revere, Mass.

The United Kingdom

186,537 Molding tire treads. C. G. Redfern, 15 South street, Finsbury, London; A. Spencer, Hawthorn Road, Caulfield, near Melbourne, Australia.

186,600 Molding pneumatic tires. E. Hopkinson, 1790 Broadway, New York, N. Y., and Hartford Rubber Works Co. (assignee of J. P. Coe, 561 West 58th street, New York, N. Y.), 691 Park street, Hartford, Conn.—all in U. S. A. (Not yet accepted.)

186,691 Molding rubber articles. F. C. Jones, 212 Upper Thames street, London.

The Editor's Book Table

Book Reviews

RUBBER LATEX IN PAPER MAKING. BY FREDERICK KAYE, A. R. C. Sc. A paper read before the Institution of Rubber Industry, September 4, 1922. Reprinted by F. R. Henderson & Co., Inc., New York, from *The India-Rubber Journal*, London.

THIS lecture and discussion gives important information concerning the importation, preservation and cost of rubber latex, the methods of its use in papermaking, accelerating effect of latex on hydration of fibers, durability, vulcanization, practical experiments, and the importance of the papermaking industry as a field for the use of latex. The discussion develops a variety of important views expressed by chemists and paper makers.

"RUBBER PRODUCING COMPANIES—1922, WITH LIST OF Directors and Secretaries." Compiled by The Mincing Lane Tea & Rubber Share Brokers' Association, Limited. Published by "The Financial Times," London, England. Cloth, 670 pages, 5½ by 9 inches.

This 1922 edition of "Rubber Producing Companies," compiled and prepared especially as an official guide for investors in rubber shares, supplies also to the rubber industry in general much valuable and comprehensive information regarding the plantations of the Far East. A supplement furnishes data concerning rubber estates in Africa, New Guinea, South America, and Mexico. The volume appears at an opportune time, and should prove invaluable as a manual of reference.

"STANDARD METHODS OF TESTING MOLDED INSULATING Materials. D 48-22." American Society for Testing Materials, 1315 Spruce street, Philadelphia, Pennsylvania. Paper, 11 pages, illustrated.

These tests are intended to apply to all solid insulating materials that are formed in molds by the application of pressure, either with or without heat.

"DO YOU?" THE SUBERS RUBBER PRODUCTS CO., CLEVELAND, Ohio. Paper, 39 pages, 6¼ by 9¾ inches, illustrated.

Under this enigmatic title, The Subers Rubber Products Co., Cleveland, Ohio, has issued an illustrated booklet describing the patented Subers L. C. I. tubular fabrics for the benefit of rubber goods manufacturers and the public. The letters L. C. I. are abbreviation for the words "laminated, cohesive, interwound or interlaid" and relate to the company's fabrics, machinery and finished products.

The methods of rubberizing and constructing L. C. I. fabrics, the machinery employed and the advantages of goods made on this principle are well illustrated and described as relates to automobile tires, hose, belting and other mechanical goods.

"KUNSTLICHER KAUTSCHUK FUR ELEKTRISCHE ISOLIERungszwecke" (Synthetic Rubber for Electrical Insulation). By Regierungsrat Dr. Kurt Geisler. No. 250 of the publishing department of the Verein Deutscher Ingenieure (Society of German Engineers), Berlin. In German. Paper, 89 pages, 7½ by 10½, illustrated.

The author presents the results of his comparisons and tests of natural and synthetic or methylated caoutchouc as to their mechanical and insulating properties. The following topics are among those treated: The mechanical testing of soft rubber in ring form samples with the Schopper tensile machine and with an apparatus built after the same design by the author for testing ring samples at varying changes of temperature; discussion of the rules for investigation of electrical insulating materials; microphotographs of hard and soft synthetic rubber and a chapter on the regeneration of and rendering plastic methylated caoutchouc vulcanized waste.

Notes and tables are included on the economic adaptability of artificial rubber. A short bibliography, chiefly German, is given. The book is a valuable addition to the literature of the technology of rubber.

"FACTS AFFECTING THE IMPORTATION OF RUBBER PRODUCTS into New Zealand." Separate monograph prepared by the Rubber Division, Department of Commerce, P. L. Palmerton, chief. Published by Bureau of Foreign and Domestic Commerce, Washington, D. C. Paper, 8 by 9 inches.

It is evident from a study of this monograph that American exports of rubber goods to New Zealand since 1920 have shown a decided decline, in part caused by the new high tariff rates. As in Australia, the duties levied on imported rubber goods are divided into three classes, the general, or highest rate being applicable to the United States. Our exports of automobile tires to New Zealand have, however, greatly increased since 1913, when the total value for such goods reached only $26,270. For the first six months of the present year our sales of automobile tires to that country are estimated at $367,381. England, Canada, and ultimately Australia, will undoubtedly greatly benefit from New Zealand's British preferential tariff.

"TECHNICAL ANALYSIS." BY DR. IR. H. I. WATERMAN. PAPER, illustrated, 71 pages, 5¼ by 8¼.

"CHEMICAL PROBLEMS." BY DR. IR. H. I. WATERMAN AND Dr. Ir. F. Goudriaan. Paper, 115 pages, 5¼ by 8¼.

Both of these books are in Dutch and published at Dordrecht, 1922, by G. Van Herwünen. The first book discusses viscosimetry, specific heat, melting points, etc., followed by analytic methods for white lead, ultramarine, lithopone, zinc oxide, etc. The second book comprises a varied list of 696 chemical problems for the student of chemistry. The problems are classified under five sections and include (1) molecular weights and combinations, (2) stochoiometry of inorganic compounds, (3) stochoiometry of organic compounds, (4) analytic problems, (5) problems in physical chemistry.

"THE RECOVERY OF VOLATILE SOLVENTS." BY CLARK S. Robinson. The Chemical Catalog Co., Inc., New York, 1922, Cloth, illustrated, 188 pages, 6 by 9 inches, indexed.

This text book for the chemical engineer is largely a mathematical discussion of the subject of solvent recovery. The book is divided into six portions as follows: elementary principles; application of solid absorbing agents to solvent recovery; recovery of vapors by condensation and cooling; the use of cooling and compression combined; scrubbing by means of liquids; and an abstract of the literature on solvent recovery.

The author has purposely omitted the operating details of solvent recovery as regards evaporation of the solvent from the material in which it has been used, and the subsequent fractional distillation of the recovered solvent to separate it from the absorbing liquid, or from other substances present.

"FIRST YEAR BOOK OF THE INSTITUTION OF RUBBER Industry, 1921-1922." Published at the Secretarial Offices, Charing Cross Road, London, England. Paper, 240 pages, 6 by 9 inches.

This first yearbook of the Institution of Rubber Industry is of interest to the trade in general, as it sets forth full accounts of the various meetings of this newly formed organization since its inception on July 20, 1921. Lists of officers and committees are included, as well as the names of all members of the institution, while an especially interesting feature is a program of the papers planned for the winter season, 1922-1923. Introductory notes

prepared by the president and ex-president set forth some of the aims and ideals of the organization, while it is elsewhere stated that one of the chief objects is the maintenance of a center for the whole of the industry in order to keep in touch, for mutual help and cooperation, with the various other rubber trade associations.

"SPECIFICATION FOR NUMBERED COTTON DUCK." CIRCULAR of the Bureau of Standard, No. 136. Superintendent of Public Documents, Washington, D. C. Four pages.

This specification dated September 22, 1922, covers material, construction, methods of tests and definition for numbered cotton duck for government and commercial use. Copies may be procured from the Superintendent of Public Documents, Washington, D. C.

Abstracts of Recent Rubber Articles

Tests for Insulating Materials. Specifications recommended by the British Electrical and Allied Industries Research Association for hard composite dielectrics, including rubber and other vulcanized and unvulcanized materials in sheets, rods, tube and final shape.—*The India Rubber Journal*, London, 1922, 64, 29-36.

Vulcanization of Rubber in Solution. If rubber, in solution in an organic solvent, is heated with sulphur at about 120 degrees C., the nature of the product depends on the concentration of the solution and the solvent used. With dilute solutions (1 to 2 per cent) and with solvents such as nitrobenzene, petrol, phenetol, etc., a gelatinous deposit is obtained drying to a hard elastic mass with black fracture. After acetone extraction it contains 15 to 30 per cent of combined sulphur, depending on the conditions. With solvents such as aniline, xylene, thymol, etc., no precipitate is obtained. With 10 per cent solutions, in solvents of the first group, the viscosity of the solution at first diminishes on heating, until it reaches a minimum, after which it rises first slowly and then rapidly until the liquid forms a gel. These gels show the phenomenon of syneresis. The sulphur content of the products obtained after extracting these gels with acetone is 20 to 30 per cent.—F. Boiry, *Comptes-Rendus*, 1922, 175, 102-104.

Ilcken-Down Process of Rubber Preparation. The Ilcken-Down process for the preparation of rubber, by the spontaneous coagulation of the latex in the presence of a proprietary mixture consisting essentially of alcohol and fused oil with the addition, next morning, of a quantity of a mixture of alcohol and petrol, and final treatment of the freshly rolled crêpe rubber with a dilute solution of sodium bisulphite and sulphuric acid, has been claimed to give a yield of rubber 5 to 15 per cent greater than that obtained by the customary methods. In three series of experiments, no such increased yield was observable. The composition of the Ilcken-Down rubber was approximately the same as that of ordinary crêpe obtained from undiluted latex, and the inner properties were normal although the rate of cure was somewhat low.—O. de Vries and W. Spoon, *Communication of Central Rubber Station*, Buitenzorg, 1921, No. 27, 1-19.

Glue in Rubber Compounds. Experimental results with glue are due to differences in the glues and to methods of mixing. It is impossible to mix carbon black uniformly into rubber without glue as a medium, but with glue, 68 per cent of carbon black by weight of the rubber has been mixed without detection by the microscope.—A. B. Kempel, *Chemical Trade Journal*, 1922, 70, 452.

Use of Serum to Dilute Rubber Latex. In order to economize acetic acid or clean water, serum from coagulation of the previous day is sometimes used for dilution of latex. If this is done uninterruptedly for weeks, accelerators formed by decomposition of the serum may accumulate and give rise to a rather rapidly vulcanizing rubber; when, however, bisulphite is regularly used, there is very little effect. The practice of using old serum may therefore give rise to irregularity in the rate of vulcanization if it becomes necessary to recommence with a fresh mixture. As the rate of vulcanization depends also on the concentration of the liquid from which the rubber is coagulated and the consequent amount of serum substances absorbed, the use of serum for dilution purposes tends to give a product with a rate of vulcanization above the normal.—O. de Vries, *Communication of Central Rubber Station*, Buitenzorg, Java, 1921, No. 28, 1-17.

Rules for Analysis of Chemicals for the Preparation of Rubber. Official methods of the rubber experimental stations in the Dutch East Indies for the analysis of sodium sulphite, sodium carbonate, formalin and acetic acid.—*Archief voor de Rubbercultuur in Nederlandsch-Indië*, 1920, 4, No. 7, 347-9, 351-3.

Effect of Mold on Quality of Smoked Sheet Rubber. The gray-green, moss-like type of mold which develops normally in daylight has a retarding effect on the rate of vulcanization, the black and yellow pin-head type which develops in the dark has an accelerating effect. A slight surface mold has no appreciable effect on the rubber quality.—H. P. Stevens, *Bulletin of the Rubber Growers' Association*, 1922, 4, 330-331.

Chassis Friction Losses. The loss of power due to the friction of the various parts of the chassis has been carefully investigated by a dynamometer. Among the topics considered are a comparison of solid tires with pneumatic and of fabric tires with cord; the ratio of tire friction to bearing friction; the effect of variations in the load and the inflation pressure on the rolling resistance of pneumatic tires; the development of resistance formulas for fabric and cord tires; a comparison of the wear of pneumatic tires with that of solid tires under the same load; the effects due to variations of speed and to heavy wall tubes, roughness of the tread, nonskid surfaces, large and small sizes, age and duration of wear, and the development of heat in tires.—E. H. Lockwood, *The Journal of the Society of Automotive Engineers*, November, 1922, 415-429.

The Analysis of Gutta Percha and Balata. The method includes tests for resin, dirt and hydrocarbon and is the same for both gutta percha and balata.—*The India-Rubber Journal*, 1922, 64, 179-180.

New Trade Publications

UNDER THE TITLE "RECREATION AND WORK SHOES, 'THE WHITE MAN'S MOCCASIN,'" The La Crosse Rubber Mills Co., La Crosse, Wisconsin, is sending out an attractive little catalog, illustrated in color. Attention is called to the division of the company's products into four grades, and also to the fact that almost all the varieties of canvas footwear, in the manufacture of which this company specializes, are fitted with "Kendex" insoles. "Kendex" is said to be a pressed wool fabric that has insulating and absorptive qualities, overcoming the prejudice that rubber soles "draw" or "burn" the feet. The four brands indicated include the "Star," "La Crosse," "Wisconsin," and "Badger" qualities, all of the "Star" brand being pressure cured goods.

"LINK-BELT PORTABLE LOADERS, BOOK 550," IS AN INTERESTING bulletin, printed in color and illustrated by many photographs, now being sent out by The Link-Belt Co., 910 South Michigan avenue, Chicago, Illinois. Many types of loaders for use in various industries are well featured and their mechanism described. It is interesting to note that rubber belting and rubber-protected boards are included in the specifications demanded for this company's various types of portable belt conveyors.

AN ILLUSTRATED BOOKLET, ENTITLED "MALMÖ FREE PORT, AND the Main Features of its Organization," published by Malmö Frihamnsaktiebolag, Malmö, Sweden, reviews the construction of harbor improvements; the building of warehouses, quays, etc., which are intended to facilitate commerce through this city. Malmö is situated just at the entrance to the Baltic and has a strategic position of importance. Goods may now be received into and warehoused in the free port and be reshipped without payment of any duty, transit fees, preventive service fees or any other charges whatsoever to the public treasury.

New Goods and Specialties

Combination Wringer and Washboard

A COMBINED wringer and washboard has above the scrubbing surface two wooden rollers covered with rubber, controlled by springs contained in metal boxes let into the frame, so that articles compressed to ½-inch in thickness may be accommodated. The inventor of the "Rubbawring" claims that the rubber, not being vulcanized to the rollers, will not damage fine lace or thin fabrics. When not in use, the tray folds down flat against the back of the board. The handle may be on either side. White enamel is popular among the different finishes.—Smith's Electric and Engineering Co., Landor Road, Shepherd's Bush, London, W. 12, England.

The "Rubbawring"

New Idea in Heels

"Circle A" Heel

The "Armstrong Circle A" rubber heel, one of the newest on the market, embodies a new idea in design. Instead of the usual depressions or cups to create suction and accommodate the nails, the design is built above the level of the heel, thereby eliminating places for mud and dirt to lodge. This heel is manufactured particularly for retailers who require heels of high quality.—Armstrong Cork Co., Shoe Products Division, Lancaster, Pennsylvania.

Swimming Collar to Inspire Confidence

The "Neptune" rubber swimming collar illustrated here is entirely different in design from any other device intended for a similar purpose—giving confidence to the would-be swimmer. The manufacturer claims that this invention will float up to 250 pounds of weight when fully inflated.—The Neptune Rubber Manufacturing Co., Irvington, New Jersey.

"Neptune" Swimming Collar

Cushioned Cord Tire

Armstrong Cord

The "Armstrong" is a new cord tire having an extra layer of gum between the plies to prevent them from separating and an extra heavy tread which, through its cushion action, keeps the fabric from being ruptured under strain.—The Armstrong Rubber Co., Inc., Garfield, N. J.

"Peter Pan" Fountain Pen

A white-tipped sautoir fountain pen is only 2½ inches long, claiming to be the smallest made.—Salz Brothers, 71 West 35th street, New York, N. Y.

Bicycle Tires for All Ages

The effort to revive the popularity of the bicycle is resulting in particular attention to bicycle tires. A new line includes both cord and fabrics, as well as a juvenile size.

The "Traxion Tread" is a two-ply cord bicycle tire, with wide tread rubber, built on the same principles as the "Royal Cord" automobile tire. The "No. 77 Giant Chain" is a three-ply fabric tire, improved over the former "No. 77 Chain Tread" by having the center rib connected by cross-bars to the chain links of the tread. Both of these tires have white sides and black tread. The "Nonpareil Thornproof" is a two-ply fabric with white sidewalls and a thornproof strip on the large studded red tread. The "Juvenile" is similar in appearance and service, but is intended for the small boy's bicycle.—United States Rubber Co., Broadway at 58th street, New York, N. Y.

"Traxion Tread Cord"

"No. 77 Giant Chain"

"Juvenile"

"Nonpareil Thornproof"

Adjustable Bandeau for Women's Hats

The "DeLeon" bandeau makes any hat fit any head. Elastic and wire, both extensible, are run in casings at the inner and outer edges. Metal prongs fasten the bandeau in place without sewing.—De' Leon Bandeau Co., 2115 Locust street, St. Louis, Missouri.

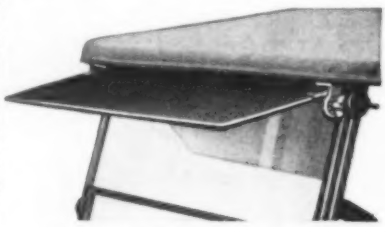
New "Armortred" Heels

"Armortred Arch Support" Heel

The newest rubber heels put out under this trade mark are the "Armortred Arch Support" heel shown here, with shoulder extending to assist in holding up the arch of the foot, and a small heel designed specially for infants, which will not mar furniture.—Quabaug Rubber Co., North Brookfield, Massachusetts.

Windshield Visor for Glare or Storm

The "Popular" windshield visor, to keep off the glare of sun or approaching headlights, or help keep the windshield clear in storm, is covered with high grade, leather-finished Du Pont Fabrikoid, outside black and inside green, and is screwed in place. It comes packed in a heavy corrugated carton, ten to the standard package, for reshipment by jobbers and dealers.—Grigsby-Grunow-Hinds Co., 900 West Lake street, Chicago, Illinois.



"Popular" Windshield Visor

Rubber and Bakelite Fountain Pen

The "Tattler," fountain pen makes it possible to see how much ink it contains. It has the usual hard rubber feed, barrel tips, and cap, but has the middle portion of the barrel made of transparent bakelite. This pen, like others from the same manufacturer, has no ink sac but is filled by "the little red pump handle" of rubber.—Dunn-Pen Co., Inc., 161 Grand street, New York.

"Tattler" Fountain Pen

Crêpe Sole for Golf

The "Pinehurst No. 7," a specially designed golf shoe, is fitted with either the "Norm-Bennett Colombo-Crêpe" rubber sole illustrated, or a patented leather sole with rubber plugs. The heel is flanged to give broad tread, which tends to throw the weight of the body more upon the toes than the heel. The particular feature of this shoe is the combination tip and ball strap, but there are five other Pinehurst sport models, all fitted with the same kind of sole.—Norman & Bennett, Inc., 144 High street, Boston, Massachusetts.

"Norm-Bennett Colombo-Crêpe" Sole

Quick-Acting Dust Cap

A new Schrader dust cap is combined with a rim nut and bushing. The rim nut and bushing are intended to be screwed down tightly against the felloe with pliers or wrench, when the dust cap may be easily screwed on or removed by hand without disturbing the bushing. It is claimed that this cap and bushing will hold the valve stem rigid and prevent creeping of the inner tube. Always apply and remove this cap by hand.—A Schrader's Son, Inc., Brooklyn, New York.

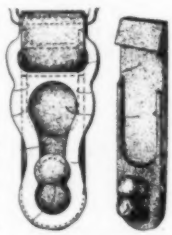
Rubber Die in Time Stamp

The "Economo," a new nickel-plated time stamp intended for heavy work, has a rubber die mounted on a cushion 3/16-inch thick and a flexible cord in the handle, assuring uniform impressions. An exterior knob sets the dial indicator.—Louis Melind Co., 183 West Madison street, Chicago, Illinois; R. A. Stewart & Co., 80 Duane street, New York, N. Y.

The "Economo"

Garter Stud

A two-headed garter stud, molded in one piece of rubber, is shown here. The wedge-shaped top portion is passed from behind through the loop for webbing at the top of the metal portion of the clasp and inserted backward through the opening just below, where it holds itself in place without stitching. This patented stud is called the "Double-Grip Never-Slip."—M. Hawie, 729 Washington avenue, Bridgeport, Connecticut.



"Double-Grip Never-Slip" Stud

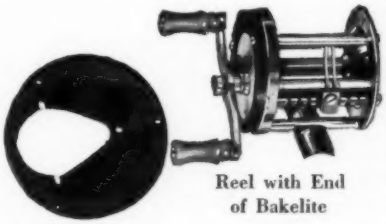
Wheel with Pneumatic Hub

The Hatfield Resilient Wheel represents one type of automobile wheel that removes the pneumatic tire from the rim and applies it around the hub, inflating it with the usual valve. The solid rubber tire at the rim eliminates punctures, rim cuts, and blowouts. The pneumatic tire around the hub is interchangeable on front and back wheels.—Hatfield Resilient Wheel Co., 431 Munsey Building, Baltimore, Maryland.

Hatfield Resilient Wheel with Pneumatic Hub

Bakelite Mounted Reel

The level winding reel here pictured has among its other refinements an end plate of molded bakelite. This material is specially adapted for this part because it is not affected by moisture and will neither expand nor contract, lose its lustrous finish, nor fail in rough usage. There is thus secured a combination of important advantages, including nicety of finish.—General Bakelite Co., 8 West 40th street, New York, N. Y.

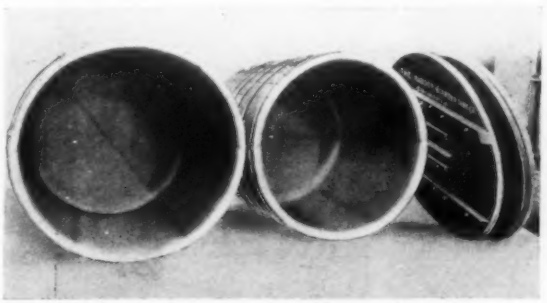


Reel with End of Bakelite

Rubber Lined Wooden Tanks

Rubber lined wooden tanks for the economical storage of muriatic acid are proving greatly superior to the glass carboys formerly supplied for this purpose.

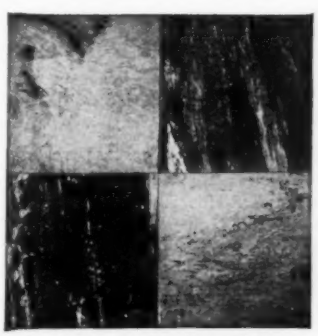
In the manufacture of these tanks, Pará rubber 3/32 or 3/16-inch in thickness is shaped into fillet pieces, wearing strips, etc., and then applied by a special process. The tank is provided with a hard rubber pipe and plug cock outlet, while to this may be attached hard rubber pipe and fittings, if necessary. The cover of the tank is also sometimes lined with rubber. The rubber lining does not loosen from the tank, and is leak proof, while the general type of construction has become popular with various chemical and steel companies.—The Hauser-Stander Tank Co., Cincinnati, Ohio.



Chemical Containers with Rubber Lining

Rubber Tiling Imitates Marble

"Vel-mar," or velvet marble, is the name given one of the newer brands of rubber floor covering. It is especially adapted for installations which will be subjected to unusually severe wear and has, in addition to the ordinary advantages of rubber flooring, noiseless, resilient, and non-slipping properties that make it a worthy addition to its manufacturer's other similar lines, known as "Velvet" interlocking and underseal rubber tile. The new tile is said to be in appearance an exact reproduction of Carrara marble.—W. H. Salisbury & Co., Inc., 308 West Madison street, Chicago, Illinois.



"Vel-mar" Rubber Tile

Air-Tight Valve Cap

The "Empire," a heavily knurled, solid brass, air-tight valve cap, has inside a cushion of specially compounded rubber which positively seals the air in the tube.—The Empire Sales Co., 90 Silliman avenue, Bridgeport, Connecticut.

"Empire"

Inflated Swimming Belt Buckles On

The "Lifeguard" swimming belt is made of good quality rubber and inflates with a valve. To the ends are fastened straps that buckle and hold it in place around the waist, the straps having several eyelets for size adjustment.—Lifeguard Swimming Belt Corporation, 358 Fifth avenue, New York, N. Y.

"Lifeguard" Belt

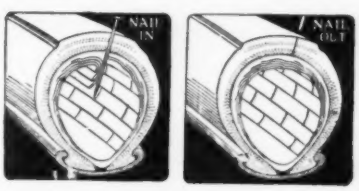
Inner Tube Bag

Dealers in tires and accessories will welcome the waterproof bag shown here. Customers supplied with one of these will be able to keep their inner tubes clean and uninjured. This inner tube bag is made in two sizes, and has a convenient wide opening at the top.—Michelin Tyre Co., Ltd., 81 Fulham Road, London, S. W. 3, England.

Inner Tube Bag

Patent Mechanical Sealing Tube

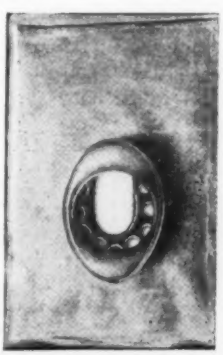
The Jeff inner tube contains a series of overlapping flaps which are merely pushed aside when a nail or thorn punctures the tire. As soon as the object is withdrawn air pressure returns the flaps to position, automatically closing the puncture.—The Jeff Patent Tube, Limited, Pembroke Road, Walthamstow, London, E. 17, England.



How "Jeff" Tube Operates

Infant's Rubber Urinal

The "Infanal" is a rubber urinal for boys, fitting accurately and comfortably, to be worn continuously. To it is attached a rubber bag filled with gauze. The gauze is easily removed and replaced and the bag washed. Devised by a children's physician, the "Infanal" is recommended for its convenience and efficiency both in the home and when traveling.—Children's Supplies Co., Hastings, Nebraska.



"Infanal," ⅓ Size

Rubber Cover for Nursing Bottles

A new rubber cover for nursing bottles is provided with metal or rubber rings for pinning to the pillow to prevent slipping, and may be decorated with attractive pictures.

One model also has an attached pocket closed with a flap, for extra nipples or other small articles.—Mrs. Philomene Ferris, Westwood, California.

Activities of The Rubber Association of America

Annual Meeting

THE Rubber Association of America, Inc., will hold its eighth annual meeting on January 8, 1923, at 2:30 p. m., in the Astor gallery of the Waldorf-Astoria, 34th street and Fifth avenue, New York, N. Y.

Annual Dinner

The twenty-third annual dinner of The Rubber Association of America will be held in the grand ballroom of the Waldorf-Astoria, New York, N. Y., on January 8, 1923, at 7:00 p. m.

Members and friends of the association are cordially invited to be present. Those wishing to reserve an entire table or to be seated with certain individuals should send such requests to the office of the association, 250 West 57th street, New York, N. Y. Reservations will close January 3. The price of the tickets will be ten dollars.

Annual Meetings of Divisions and Committees

Monday, January 8, 1923

Traffic Committee
New York Athletic Club.....10.30 a. m.
Rubber Reclaimers' Division
Yale Club.....10.00 a. m.
Hard Rubber Division
Yale Club.....10.00 a. m.
Mechanical Goods Division
Yale Club.....10.00 a. m.
Rubber Clothing Division
Yale Club.....11.00 a. m.
Foreign Trade Division
Union League Club.....12.00 m.
Board of Directors (Organization Meeting)
Waldorf-Astoria.....4.00 p. m.

Tuesday, January 9, 1923

Executive Committee—Tire Manufacturers' Division
Yale Club.....10.30 a. m.
Cycle Tire Manufacturers' Committee
Yale Club.....10.30 a. m.
Service Managers' Committee
Yale Club.....10.30 a. m.
Executive Committee—Rubber Sundries Division
Yale Club.....11.00 a. m.
Rubber Proofers' Division
Yale Club.....12.00 m.
Rubber Sundries Division
Yale Club.....1.00 p. m.
Tire Manufacturers' Division
Yale Club.....1.00 p. m.
Rubber Heel Division
Yale Club.....1.00 p. m.

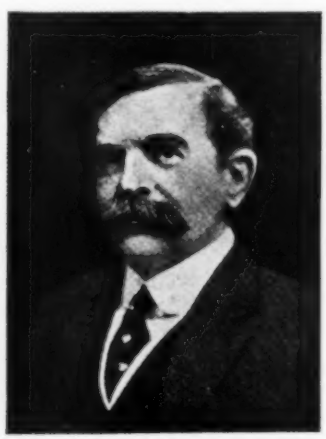
RUBBER GROWERS' REPRESENTATIVES TO CONFER WITH THE RUBBER ASSOCIATION OF AMERICA

The Rubber Growers' Association of London recently appointed three representatives who will soon visit the United States in order to confer with The Rubber Association of America, Inc., and kindred organizations regarding the proposed restriction of crude rubber production. These delegates include men of prominence in the rubber industry, all being directors of various rubber producing companies.

The India-Rubber Journal

P. J. Burgess

H. Eric Miller



Sir Stanley Bois

P. J. Burgess, at present acting as vice-chairman, entered the Straits Settlements Civil Service as government analyst in 1900, and since that time has been actively interested in certain rubber plantations of the Far East.

H. Eric Miller is connected as director with more than twenty rubber plantations in Sumatra, Java, and other sections of the Far East.

Sir Stanley Bois has been for many years associated with the rubber industry of Ceylon, having also been Commissioner General for that island at the St. Louis Exposition in 1904.

HENDERSON BROS. ISTHMIAN STEAMSHIP CO. AGENT

Henderson Brothers, Ltd., of Singapore, has been recently appointed agent for the Isthmian Steamship Co. for the Straits Settlements, Federated Malay States, and the Dutch East Indies. This is the largest independent steamship line operating different routes in all parts of the world. A new service has been established direct from New York, Philadelphia, and Baltimore to the Philippine Islands, Malay Peninsula and the Dutch East Indies, exclusively. The present service of one steamship each month will be increased as business developments justify. The "Fairfield" is the first sailing from Singapore and adjacent ports. It is interesting to know that this steamship carried nine or ten thousand tons for American ports.

Annual Banquet of the Rubber Trade Association

THE annual banquet of the Rubber Trade Association of New York, Inc., was held on the evening of December 14, in the Astor Gallery of the Waldorf-Astoria, New York, N. Y.

Having passed the most critical year ever experienced in the trade, this notable gathering reflected the spirit of optimism and confidence in the future possessed by the crude rubber men of New York.

Suitably decorated for the occasion, the banquet hall and the flower strewn tables made an appropriate setting for the excellent menu that was served to 175 members and guests. Meanwhile, there was orchestra music and popular songs were sung between courses of the dinner.

President F. R. Henderson's address that followed briefly touched on the sad experiences of last year while expressing unbounded hope for the future. The work accomplished by the association was ably reviewed and due credit given to the committee chairmen and the general manager for the successful results achieved.

F. R. Henderson, President, Rubber Trade Association

While in agreement with the spirit of crude rubber restriction and the necessity of a stabilized rubber market, Mr. Henderson said that the law of supply and demand will ultimately prevail. "While our British friends have felt the need of temporary stimulation they will, in consideration of the whole industry's future welfare, be just as anxious to use means to prevent an undue advance as they were to find a market level sufficient to give a fair return on the capital invested in plantations."

He spoke of the necessity of cooperation and quoted the following as a basic precept in the solution of the present crude rubber problem. "If we can only educate the mass of each section that its interests are interdependent and practically identical, we shall have accomplished a great work. It is not in the interests of manufacturers that producers should be ruined, nor is it to the advantage of producers that consumers should lose money. The bulk of people are far from realizing this at present, though I believe the heads of the trade appreciate this point."

In closing, Mr. Henderson pleaded for the coordinated effort and practical spirit that makes for pleasant business intercourse. "Let us go farther than the present exigencies demand and build today a foundation in the rubber trade international that will insure a lasting league of rubber associations that may not have fourteen points but one grand and glorious sentiment of live and let live, regardless of sectional interests."

The Reverend Willard-Scott, of Brookline, Massachusetts, concluded the evening's entertainment a well known statesman and orator. His forceful, logical address carried the message to every one present, that our national condition will return to normalcy only through the unselfish cooperation of capital and labor.

The Reverend Willard Scott, of Brookline, Massachusetts, concluded the evenings entertainment with an incomparable address that was brilliant in wit, emphasized with humorous anecdotes, and that ended with an invocation for divine guidance in our worldly affairs.

Annual Banquet of the Rubber Trade Association of New York, Inc.

PALMERTON RETURNS TO WASHINGTON

P. L. Palmerton, chief of the Rubber Division, Bureau of Foreign and Domestic Commerce, recently returned to Washington, after spending the last six months in Europe. In the course of his investigations regarding the rubber industry in the Old World, Mr. Palmerton secured valuable information regarding British and Belgian markets.

FIRESTONE SCHOLARSHIP AWARD

The four years' university scholarship offered by Harvey S. Firestone, president of The Firestone Tire & Rubber Co., Akron, Ohio, in connection with the 1922 Good Roads Contest, was won by Karl G. Pearson, a native of Lindsborg, Kansas, but at present a student at the Eastern High School, Washington, D. C.

The Obituary Record

Long a Prominent Rubber Reclaimer

WILLIAM FURLONG ASKAM, for many years prominent in the rubber reclaiming business, died suddenly of apoplexy, October 5, 1922, aged 59 years.

William F. Askam

Born January 21, 1863, in Philadelphia, Pennsylvania, he was a mechanical engineer graduate of Franklin Institute. His first business experience was with the Franklin Sugar Refinery, which he soon left to join the Mitchell Rubber Co., reclaimers, whence he went as general manager to the old Derby Rubber Co., at Derby, Connecticut, which was later taken over by the United States Rubber Reclaiming Co. He built and for some time managed this firm's Buffalo, New York, plant.

Following seventeen years of retirement, during which he invented processes, sold formulas, and designed reclaiming plants, including a large concern in England, Mr. Askam organized the new Derby Rubber Co., of which he was vice-president and general manager. In 1913 he organized the Askam Rubber Co., Milford, Connecticut, which operated for six years on a day and night basis and went out of business in 1918.

He was the inventor of the Askam separator, used in many reclaiming plants, and of the formula for Askam special wire stock well known in the insulation trade.

Mr. Askam was a thirty-second degree Mason and highly regarded in the rubber industry. He is survived by his widow and two sons.

Inventor and Manufacturer of Tire Machinery

Peter D. Thropp, vice-president of the John E. Thropp's Sons Co., rubber machinery manufacturer, Trenton, New Jersey, died suddenly of apoplexy at his home on November 25, aged 56 years.

Peter D. Thropp

Born in 1866, he was the son of John Edwin Thropp, one of the pioneers in the rubber machinery industry of Trenton, the business originally having been founded by him in 1878. Following his education in the Trenton High School and Stewart Business College, he entered his father's business and served a four years' apprenticeship in the machine shop. About three years later he was placed in charge of the plant as general foreman, a position which he held for about ten years.

In 1904, together with Albert de Laski, of Weehawken, New Jersey, he began developing a machine for making circular woven fabric for automobile tire carcasses. This soon led to his devoting his entire attention to the design and production of machinery and equipment for improving and simplifying tire manufacture, and many notable patents have rewarded his efforts.

At the time of his death Mr. Thropp was vice-president of the John E. Thropp's Sons Co., Eureka Flint & Spar Co., Hendrie Rubber Co., Torrance, California; treasurer of the De Laski & Thropp Circular Woven Tire Co., of a director of the Bergougnan Rubber Corporation, of Trenton, New Jersey.

He was an Elk and a Mason, also one of the Knights Templars, and was a member of the Trenton Country Club and the Carteret Club.

In the untimely passing of Mr. Thropp the rubber industry has lost a man of great mechanical talent whose inventive facility bordered on genius, and whose patented machinery will long continue to be an important factor in the tire industry.

Founder of the Hewitt Rubber Co.

Herbert H. Hewitt, founder and president of the Hewitt Rubber Co., Buffalo, New York, died there on December 19, aged 67 years. His obituary will be published in the February issue of THE INDIA RUBBER WORLD.

Head of an Insulated Wire Concern

John W. Pearce, president of the Philadelphia Insulated Wire Co., died November 7, 1922, at his home in Bryn Mawr, Pennsylvania, aged 73 years. For many years in the dry goods business, he engaged in the manufacture of insulated wire about ten years ago. He was also a director of the Bank of North America, the Northern Liberties Bank and several insurance companies.

UNITED STATES RUBBER GOODS EXPORTS INCREASING

Exports of rubber manufactures registered a distinct recovery in October, the total value, $2,956,638, being close to $300,000 in excess of the preceding month, according to compilations by the Rubber Division of the Department of Commerce. The principal commodities in which exports showed increases were automobile casings and tubes, rubber belting, canvas shoes with rubber soles, and druggists' rubber sundries.

Exports of automobile casings from the United States increased in number from 107,457 to 113,000. The exports to Italy, Belgium, Sweden, Argentina, Uruguay, and Brazil were larger than for any preceding month of the year. Seasonal activity in the Southern Hemisphere is further indicated by large shipment to Australia and British South Africa. Australia, Brazil, Italy, and Sweden took a greater volume of our inner tube exports than for any other month in 1922, but the total number of tubes exported, 73,810, was about average.

Relatively large shipments of rubber belting to Argentina, Cuba, Panama, Brazil, Peru, Spain, Japan, Australia, New Zealand, and Portuguese East Africa accounted for most of the increase of $37,000 over the preceding month. Cuba, Argentina, Australia, and New Zealand also took larger quantities of rubber hose than usual.

Exports of rubber soled canvas shoes during October amounted to 225,941 pairs valued at $170,501. Our chief markets for rubber soled canvas shoes were: Argentina, Cuba, the British and Dutch West Indies, Uruguay, British India, Australia, and New Zealand.

England is the principal market for druggists' rubber sundries and the increase from 11,107 pounds valued at $15,376 in September to 50,095 pounds valued at $50,011 in October accounts for the large volume of the October trade, which was only exceeded during March of this year.

News of the American Rubber Trade

Financial

Dunlop Rubber Financing

THE Dunlop Tire & Rubber Corporation of America, the American subsidiary of the Dunlop Rubber Co., Limited, in England, the world's pioneer tire company, has issued an offering of first (closed) mortgage and collateral trust sinking fund 7 per cent convertible gold bonds equivalent at par of exchange to $15,866,700. Of this total, Series A (American series) amounts to $11,000,000; Series B (British series) £1,000,000.

The bonds are guaranteed principal, interest and sinking fund by the British company, and in addition are secured by $14,600,100 of Dunlop Rubber Co., Limited, first mortgage 8 per cent debenture stock (English equivalent of American first mortgage bonds) and by a first mortgage on the assets of the American company valued at more than $16,000,000, including (at $4,000,000 less than cost) the company's modern tire and fabric plants at Buffalo and Utica, New York, respectively. The net assets of the British company and its subsidiaries, including the American company, after deducting all liabilities except funded debt, amount to over $78,500,000, or more than 2½ times total funded debt of both companies.

The Dunlop Rubber Co., Limited, is carrying on a business established in 1889, and today supplies more than 50 per cent of the automobile tires used in Great Britain, besides exporting largely to the dominions and other countries. It has its own rubber plantations in Malaya and its own cotton mill with capacity for its entire requirements.

For the year ended August 31, 1922, net earnings after depreciation charges and all other adjustments were $5,904,899, or over 2½ times interest requirements on total funded debt, including this issue of the British company and all subsidiaries.

This new issue of bonds is convertible after December 1, 1924, into 8 per cent cumulative preferred stock and common stock of the Dunlop Tire & Rubber Corporation of America at the rate of $1,000 par value of preferred stock and two shares no par value common stock for each $1,000 of bonds.

Firestone Statement and Annual Meeting

The Firestone Tire & Rubber Co. sales for the fiscal year ended October 31 were $64,507,301.77, representing an increase of 23 per cent in units sold over the previous year, according to a statement made to stockholders at their annual meeting by Harvey S. Firestone, president of the company.

Earnings, after providing for depreciation, interest, taxes and other charges, were $7,348,421.59. After payment of preferred dividends and miscellaneous charges there was shown a net increase of $16 per share in the common stock equity. Bank indebtedness was reduced from $21,680,000 at the beginning of the fical year to $12,775,000 at its close.

During the year the Firestone Canadian company financed itself through the sale of a $1,500,000 seven per cent bond issue, the parent company owning the entire outstanding preferred and common stock. The Canadian plant has a present capacity of 1,600 tires daily, and is so planned that additional production can readily be procured when required.

The Firestone company's assets, according to the statement given out, include: Cash, $5,715,459.38; receivables, $9,852,762.72; inventories, $9,890,050.47; Coventry Land & Improvement Co., $3,013,708.80; other accounts, $5,820.78; investments, $4,651,265; treasury stock, $174,028.78; real estate, plants, etc., $21,174,350.17; deferred charges, $426,793.70, making a total of $60,718,634.45.

Liabilities are listed as follows: Notes and acceptances payable, $12,775,000; accounts payable (purchases, pay-rolls, etc.), $2,539,533.99; accrued accounts, $320,066.22; reserve, $300,000; capital stock, $9,500,000 in preferred 6 per cent cumulative, this representing 100,000 shares authorized ($10,000,000) less $500,000 retired; 400,000 shares of 7 per cent cumulative ($40,000,000) less $30,000,000 unissued, leaving a balance of $10,000,000; common stock, $3,558,000, representing 2,500,000 shares authorized ($25,000,000), less unissued and in treasury ($21,442,000); general surplus, $20,595,595.99, and insurance account surplus, $1,130,438.25.

Dividends Declared

COMPANY	STOCK	RATE	PAYABLE	STOCK OF RECORD
Allis-Chalmers Mfg. Co., Inc.	Pfd.	$1.75 q.	Jan. 15	Dec. 23
Armstrong Cork Co.	Com.	1½% q.	Jan. 2	Dec. 27
Armstrong Cork Co.	Com.	1% ex.	Jan. 2	Dec. 27
Armstrong Cork Co.	Pfd.	1¾% q.	Jan. 2	Dec. 27
Bliss, E. W., Co.	Com.	$0.55 q.	Jan. 2	Dec. 21
Bliss, E. W., Co.	1st Pfd.	$1.00 q.	Jan. 2	Dec. 21
Bliss, E. W., Co.	2d Pfd	$0.15 q.	Jan. 2	Dec. 21
Brunswick-Balke-Collender Co.	Pfd.	1¾% q.	Jan. 1	Nov. 15
Converse Rubber Shoe Co.	Pfd.	$3.50 s.a.	Dec. 1	Nov. 15
Converse Rubber Shoe Co.	Pfd.	$3.50 s.a.	June 1	May 15
du Pont, E. I., de Nemours & Co.	Com.	$0.50 stk.	Dec. 29	Dec. 16
du Pont, E. I., de Nemours & Co.	Pfd.	1½% q.	Jan. 25	Jan. 10
Easthampton Rubber Thread Co.	Com.	200% stk.	.....	Dec. 7
Firestone-Apsley Rubber Co.	Pfd.	3½% s.a.	Jan. 1	Dec. 28
Hood Rubber Co.	Com.	$1.00 q.	Dec. 30	Dec. 20
Hood Rubber Products Co., Inc.	Pfd.	1¾% q.	Dec. 1	Nov. 23
Kelly-Springfield Tire Co.	6% Pfd.	$1.50 q.	Jan. 2	Dec. 15
Quahaug Rubber Co.	Com.	100% stk.	.....	.....
United Shoe Machinery Corporation	Com.	$0.50 q.	Jan. 5	Dec. 19
United Shoe Machinery Corporation	Pfd.	$0.37½ q.	Jan. 5	Dec. 19
Westinghouse Electric & Mfg. Co.	Com.	$1.00 q.	Jan. 31	Dec. 29
Westinghouse Electric & Mfg. Co.	Pfd.	$1.00 q.	Jan. 15	Dec. 29
Westinghouse Electric & Mfg. Co.	A B	$1.75 q.	Jan. 31	Dec. 30
Westinghouse Electric & Mfg. Co.	A.B	$0.35 stk.	.....	.....
Winnsboro Mills	Com.	2% q.	Jan. 2	Dec. 23
Winnsboro Mills	Pfd.	1¾% q.	Jan. 2	Dec. 23

New York Stock Exchange Quotations

December 26, 1922

	High	Low	Last
Ajax com.	12	11¾	11¾
Fisk com.	13⅛	12½	13
Goodrich com.	34⅜	34	34
Goodrich pfd.	83¾	83¾	83¾
Kelly-Springfield com.	44¾	44¼	44¼
Lee com.	26¼	26	26
United States Rubber com.	53	52½	52¾
United States Rubber 1st pfd.	96¾	96¾	96¾

Akron Rubber Stock Quotations

Quotations of December 27 supplied by App-Hillman Co., Akron, Ohio, were as follows:

	Last Sale	Bid	Asked
American com.	15	13	15
American pfd.	70	..	70
Amazon com.	2	..	5
Firestone com.	74	74	75
Firestone 6% pfd.	98½	98½	99½
Firestone 7% pfd.	91⅛	91	92½
General com.	250	300	..
*General 7% pfd.	98	96	100
Goodrich 6½s	101⅜	101¼	101¾
Goodyear com.	9⅜	9⅜	10¼
Goodyear 7% pfd.	29¾	29¾	30
Goodyear prior pfd.	69½	68½	69¼
Goodyear 1st mtg.	114½	114	114½
Goodyear deb.	99¼	98	99½
India com.	82½	85	..
India 7% pfd.	83	83	..
Mason com.	6¼	6	7
Mason 7% pfd.	45½	44	46
Marathon	2	1½	2
Miller com.	75	70	75
Miller 8% pfd.	100¼	100	100½
Mohawk com.	13	15	20
Mohawk 7% pfd.	70	67	72
Rubber Products	22	19	..
Seiberling com.	7½	7¾	8½
Seiberling 8% pfd.	60	60	65
Star com.	20	15	25
Star 8% pfd.	..	..	80

*Ex-dividend.

The Rubber Trade in the East and South

Manufactured Goods—New York

A steady improvement is noted in all lines of the rubber manufacturing industry. In tire output there has been less seasonal decrease in production and for a briefer time than usual. The record output of automotive vehicles the past year and outlook for similar conditions for the new year necessitates continued tire production on a corresponding scale.

The same holds true with automobile topping in the production of which the mills are very busy. Insulated wire for railway and building requirements is in active demand, orders standing well in advance of output. The boot and shoe factories are turning out footwear on large ticket schedules, particularly in warm goods for winter and spring wear. The production of heels is advancing to still greater volume of output and seems to be without seasonal features except in Canada where there is a marked decline during the midwinter months.

Weatherproofed clothing is in the off season although the new lines for spring wear will soon be in production. Druggists' sundries, novelties and minor lines all show very satisfactory progress and prospects.

Mechanical goods are in good demand and factories are on full time at capacity output. A general advance in prices has been announced, due to the increased costs of crude rubber and cotton fabrics.

New York

Howe Rubber Corporation, New Brunswick, New Jersey, has appointed T. R. Brown its New York district manager, with headquarters at 232 West 58th street, New York, N. Y.

The Bergougnan Rubber Corporation, Trenton, New Jersey, has appointed R. H. Hale & Co., Fisk Building, Broadway and 57th street, New York, N. Y., its direct factory representatives for Greater New York. Good headway is reported in the manufacture of the new "Gold Seal" cord tire put on the market about a year ago.

The Corrugated Rubber Corporation, 57 Market street, Poughkeepsie, New York, hopes to start production February 1 in its new factory now being finished on Violet avenue. D. W. Wilbur, former mayor of Poughkeepsie, has been elected a member of the board of directors. The company specializes in corrugated red rubber inner tubes.

The Rossendale-Reddaway Belting & Hose Co., Newark, New Jersey, has placed Paul M. Lockwood in charge of the sales of its automotive division, Woolworth Building, New York, N. Y.

Jonas & Bremner, Inc., 23-25 Beaver street, New York, N. Y., is a new firm of crude rubber brokers who will handle New York importers' and dealers' business exclusively. Mr. Bremner is well known in Pará where he was lately engaged in the export business, and Mr. Jonas, who is well acquainted in the Pará rubber trade, was the American representative of the Winchester Co. for many years.

J. H. Stitt, the eastern representative of the Krippendorf-Tuttle White Cliffs Products Co. with general sales offices at 30 North Michigan Boulevard, Chicago, Illinois, has had a wide experience in commercial and rubber lines, having been connected with some of the largest concerns in this country.

The creditors' committee of The Batavia Rubber Co., Batavia, New York, which recently purchased the company's plant and assets, has since resold the property to a group represented by W. N. Freeman and M. J. Kurtz. Mr. Freeman was formerly assistant treasurer of The Fisk Rubber Co., Chicopee Falls, Massachusetts.

Alfred D. Guiney is the eastern representative of The Ault & Wiborg Co. of New York, with offices at 461 Eighth avenue, New York, N. Y.

Curran & Barry, dealers in cotton fabrics, who have been located since 1903 at 70 Worth street, New York, N. Y., will move on January 2 to 320 Broadway. They will continue as sole selling agents of The Dunson Mills, La Grange, Georgia, and the Summerville Cotton Mills, Summerville, Georgia.

R. T. Vanderbilt Co., Inc., 50 East 42nd street, New York, N. Y., announces an addition to its personnel in the appointment of W. H. Cope as technical secretary and assistant to Dr. A. A. Somerville. Mr. Cope has been previously connected during the last seven years with the Lee Tire & Rubber Co., Conshohocken, Pennsylvania.

John Healey, director of W. & A. Bates, Limited, Leicester, England, was recently in the United States on a business trip.

T. Redfern, managing director of Redfern's Rubber Works, Limited, Hyde, near Manchester, England, returned home last month after several weeks' sojourn visiting American rubber mills.

Among the names of firms recently elected to membership in The Merchants' Association, New York, N. Y., appears the following: Callaway Mills, Incorporated, Ely R. Callaway, vice-president and treasurer, 345 Madison avenue, selling agents for cotton goods.

Pennsylvania

The Vulcan Rubber Co., Erie, Pennsylvania, has appointed Roscoe M. Gage factory superintendent and production manager. He was formerly with the Seiberling Rubber Co., Akron, Ohio.

On November 1, Montgomery Bros., Inc., specializing in the manufacture of liquid rubber cements and steam and hydraulic packings, with former offices at 45 South Second street, removed all departments of its business to Penrose avenue and Packer street, Philadelphia, Pennsylvania.

The South

The Doss Rubber & Tube Co., Atlanta, Georgia, has added to its mill room equipment a large rubber mill capable of breaking down sufficient rubber for 250 to 400 tires. T. J. Davis, formerly vice-president and general manager of the company, but disassociated with it since 1919, was elected president and general manager in November last, succeeding C. C. Harper. The revised board of directors consists of three new members besides Mr. Harper—Warren M. Sutton, Edison, and Drs. W. P. Glover and Stephen Barnett, Atlanta, both in Georgia.

Construction was begun December 1 on the six-story structure to be built on a lot 100 by 150 feet at Jones avenue and Marietta street, Atlanta, Georgia, to be known as the Westinghouse Electric Building. It will cost $360,000, and has been leased by the Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pennsylvania, in accordance with whose specifications it is being built for offices, warehouse, and service station. It is expected it will be completed by May.

M. L. Cannon, president of the Cabarrus Cotton Mills, Kannapolis, North Carolina, has been elected chairman of the board of directors of the Buck Creek Cotton Mills, Siluria, Alabama.

D. A. Jolly, formerly overseer of weaving at the Lanett Cotton Mills, Lanett, Alabama, has been appointed assistant superintendent of the Cabarrus Cotton Mills, Kannapolis, North Carolina.

The Brazilian Rubber Co., Inc., 14-18 Commerce street, Norfolk, Virginia, is the only rubber store in that locality handling all lines of rubber goods, including belting, hose, packing, footwear, and rubber sundries, and specializing in mechanicals. It was started in 1921 by Walter Y. Hosier, associated with C. R. Gilbert and W. L. Nelms, all of whom had formerly been connected with The B. F. Goodrich Co. Mr. Hosier had worked his way up with the Goodrich company from the position of stenographer in the Norfolk branch to manager in charge of the mechanical goods branch

at Baltimore, Maryland, having been successively salesman and southeastern district branch sales manager.

The Paul Rubber Co., Salisbury, North Carolina, manufacturer of tires, tubes, and rubber specialties, announces the appointment of C. H. Hobson as assistant to R. B. Tracy, sales and advertising manager. Mr. Hobson had previously served as secretary of The Gillette Rubber Co., and later with The New Jersey Car Spring & Rubber Co., Inc.

New Incorporations

Ace Tire & Rubber Co., Inc., November 21 (New York), $500. B. A. Daly; T. F. MacMahon; L. W. Eggersman, all of 1400 Broadway, New York City. To manufacture tires.

American-Mutual Manufacturing Co., The, October 30 (Ohio), $150,000. G. H. Bellman; J. A. Hopkins; C. A. Patterson; J. F. Hower; A. M. Katz. Principal office, Cleveland, Ohio. To manufacture rubber products.

Axtell Auto Accessories Co., January 5 (Illinois), $24,000. J. E. Axtell, president; P. M. Axtell, secretary. Principal office, 1507 Michigan Boulevard, Chicago, Illinois. To distribute "Corduroy Cord" tires.

Batavia Holding Corporation, November 24 (New York), $75,000. S. B. Howard; G. V. Reilly; H. C. Hand, all of 65 Cedar street, New York City. To manufacture rubber goods.

Berkshire Talc Products Corporation, November 13 (New Jersey), $125,000. H. Unger; F. G. Ross; H. Shuster; G. E. Ehehalt, all of Newark, New Jersey. Principal office, 207 Market street, Ordway Building, Newark, New Jersey. To mine and otherwise extract and remove ores and minerals of every variety, including talc, etc.

Blackburn Sales Co., September 11 (South Carolina), $10,000. R. H. Blackburn, president and treasurer; L. L. Blackburn, secretary. Principal office, Spartanburg, South Carolina. To deal in tires and tubes.

Blackwood Tire & Rubber Co., The, October 30 (Ohio), J. S. Mishne, president; S. B. Ellis, vice-president; F. Krause, secretary and treasurer. Principal office, 1714 East 55th street, Cleveland, Ohio. To manufacture tires, tubes and mechanical rubber goods of all description.

California Tire & Rubber Co., July 21 (California), $500,000. L. N. Wheatton; L. Beach. Principal office, Torrance, California. To deal in tires.

Cleveland Rubber Products Co., The, November 22 (Ohio), $750,000. B. A. Boerloer; G. C. Long; J. N. Wheatley; J. H. Rose; C. L. Thompson. Principal office, Cleveland, Ohio. To manufacture rubber tires and rubber products.

Continental Tire & Tube Co., Inc., November 24 (New York), $100,000. F. H. Butehorn; R. A. MacLean; G. F. Ferris, all of 37 Wall street, New York City. To manufacture automobile tires and tubes.

Cottage Grove Tire & Battery Service, Inc., September 27 (Illinois), $5,000. A. M. Keasey; A. Wadoz; E. E. Miller. Principal office, 7518 Cottage Grove avenue, Chicago, Illinois. To buy and sell tires, tubes, storage batteries, accessories.

Direct Products Co., The, November 8 (Ohio), $10,000. J. J. Monarty; A. W. Wentz; P. B. Bosworth; J. C. Clark; S. L. Tatum. Principal office, Springfield, Ohio. To manufacture rubber products.

Duratex Manufacturing Co., The, November 21 (Ohio), $200,000. J. G. Blackstock; E. J. Hoffe; H. D. Gottfried; J. S. Silber; J. J. Nessy. Principal office, 1110 Hippodrome Building, Cleveland, Ohio. To manufacture rubber products of all kinds.

Elyria Rubber Co., The, November 3 (Ohio), $50,000. W. E. Shay; H. Kofsky; C. A. Barth; R. B. Struthers. Principal office, Elyria, Ohio. To manufacture and deal in all rubber goods.

Empire Tire & Rubber Corporation of N. J., December 4 (New Jersey), $10,000. W. H. Apgar; W. N. Cooper; T. H. Baddeley. Principal office, 36 East State street, Trenton, New Jersey. To manufacture, purchase and sell any and all kinds of rubber goods.

Federal Tire Sales Co., October 11 (Kentucky), $2,000. T. Thierman; J. J. Etheridge; L. B. and T. J. Yager. Principal office, Louisville, Kentucky. To deal in tires and automobile accessories.

447 Tire & Service Co., August 23 (Illinois), $25,000. W. M. Oertlin, president; E. B. Schultz, vice-president; L. Macher, secretary; W. F. Kral, treasurer. Principal office, 547 East Court street, Kankakee, Illinois. To sell and repair tires, tubes, batteries and accessories.

Henry, William M., Co., Inc., December 18 (New York), $20,000. W. M. and M. Henry, both of 8 West 72nd street; H. McInerney, 504 West 159th street, all of New York City. To manufacture notions, rubber goods, tires, etc.

Lufbery Co., The, November 23 (New Jersey), $100,000. C. E. Bullinger, president; W. J. Moren, vice-president and treasurer; P. G. Cruden, secretary. Principal office, Elizabeth, New Jersey. To deal in chemicals for the rubber trade.

Pine Tree State Rubber-Heel Co., October 26 (Maine), $200,000. F. W. Hodges, president and treasurer; T. D. Cowen, vice-president; C. F. Getchell; F. R. Merritt. Principal office, Sabattus, Maine. To manufacture rubber heels and molded rubber goods.

Ray Rubber Products Corporation, November 6 (New Jersey), $10,000. E. A. London; D. R. Smith; T. J. Ryan. Principal office, 54 Woolsey street, Irvington, New Jersey. To manufacture, buy and sell rubber and leather products of all kinds and descriptions.

Semple Manufacturing Co., November 3 (New Jersey), $100,000. C. H. Semple, president; W. B. John, treasurer; J. W. Miller, secretary. Principal office, Trenton, New Jersey. To manufacture inner tubes.

Timesaver Co., The, November 3 (Ohio), $50,000. C. H. Day, president; L. G. Porteous, secretary and treasurer. Principal office, 1312 Ontario street, Cleveland, Ohio. To manufacture "Timesaver" self-vulcanizing patch.

Yale Tire & Accessories Corporation, December 11 (New York), $20,000. P. T. Kammerer, Jr., 157 East 46th street, New York City; E. Lewin, 870 Manida street, Bronx, New York; G. Meisels, 240 Ralph avenue, Brooklyn, New York. To deal in tires and accessories.

Your Tire Co., October 4 (Kentucky), $1,500. H. B. Mahan, president; E. C. Hoagland, treasurer; E. Woodward, secretary. Principal office, Louisville, Kentucky. To distribute tires.

Head of Baird Rubber & Trading Co., Inc.

William Torrey Baird, president and treasurer of the Baird Rubber & Trading Co., Inc., crude rubber importer, New York, N. Y., was born May 27, 1855, in Toledo, Ohio. Following his education in the public and boarding schools there, he was for a time in 1872 employed in an insurance actuary's office, but the following year went to the New York Belting & Packing Co., first as office boy and later as assistant in the book-keeping department, where his aptitude for figures won rapid advancement.

William T. Baird

In 1878 he was made head bookkeeper; in 1886, cashier; a little later, secretary, and in 1900, treasurer. In 1896, when the Mechanical Rubber Co. was organized, he was elected assistant treasurer of that company, and soon afterward, on the resignation of August Belmont, Mr. Baird succeeded him as treasurer. From that time he continued as treasurer of both firms until he resigned in 1902 to become president and treasurer of the Rubber Trading Co., then just organized by his brother, Robert B. Baird, an experienced crude rubber broker.

This firm, now known as Baird Rubber & Trading Co., Inc., and including Robert L. Baird and Collier W. Baird, sons of the founders, has become one of the most important in the crude rubber field, with extensive foreign connections and buying facilities.

Mr. Baird's experience and acquaintance in the rubber trade of New York are long and wide, while his abilities and genialities are fully appreciated by his many clients and friends.

He is a member of The Rubber Association of America, various Masonic bodies, and of the Sons of the American Revolution.

THE SOUTHWEST COTTON CO., A GOODYEAR TIRE & RUBBER CO. subsidiary, which has hitherto accepted only Pima long staple cotton at its Phoenix ginning plant, the largest in the Salt River Valley, Arizona, has informed growers of short staple cotton that it will gin their product at Phoenix and also provide for handling short staple at other plants owned by the company. Owing to the present low price of Pima, due it is said, to the large influx of Egyptian cotton attracted by the abolition of the 7 cents a pound duty in the new tariff measure, several thousand acres on which long staple has been grown will be planted next season to short staple, which growers can market at a good profit. The Southwest company will continue to plant Pima exclusively on its own large plantations.

THE ECKRODE ENDLESS EXTENSOR FLAP FOR CLINCHER RIMS IS made of rubber with flannel reinforcement at the valve hole. It protects the inner tube from coming in direct contact with the rim and also prevents pinching of the tube by cushioning the beads. —Eckrode Rubber Co., Inc., New Brunswick, New Jersey.

The Rubber Trade in New Jersey

Manufactured Goods—Trenton

Trenton rubber manufacturers in all lines have reason to feel thankful for a very satisfactory business year now ending with rather unusual activity. A canvass of various manufacturers indicates that in every instance production and sales for 1922 far exceed those for 1921. While it is true that prices have not been entirely adequate, particularly for future business booked for delivery in the early months of 1923, because of substantial advances in the prices of leading raw materials, still the results on the whole cannot be considered other than satisfactory. Selling prices have been steadily advanced for the last two months or more and business now being booked is on the basis of current market values of raw materials.

The tire business is probably the only portion of the industry which is not quite up to the mark, and with the prospect of an advance in selling prices in the very near future this line will no doubt soon be placed upon a more satisfactory basis. All the factories go into the new year with a considerable volume booked for future delivery, more than sufficient to insure active operation well into the early summer.

Asbestos Patent Licensees Must Account to Stockholders

Opinion was filed by Vice-Chancellor Buchanan on December 16 in the New Jersey Court of Chancery, directing that the Thermoid Rubber Co. of Trenton and the H. W. Johns-Manville Co., of Philadelphia, Pennsylvania, submit to an accounting of profits to Milford C. Massey and other stockholders of the Asbestos Brake Co., because of patents used in manufacturing asbestos brake linings since 1911. It was shown by separate respective written agreements each dated May 2, 1911, that the Asbestos Brake Co., owner of certain patents, granted licenses to the Thermoid and Johns-Manville companies to manufacture, sell and use brake linings under patents. The vice-chancellor ruled that the defendants contracted to pay to the Asbestos Brake Co., monthly, certain royalties on all such material made and sold by them, and to send daily and monthly reports of all such loss of sales. Mr. Massey, a stockholder, being unable to procure the Asbestos Brake Co. to bring suit, filed a bill on behalf of himself and other stockholders against the licensees, joining the Asbestos Brake Co. as a defendant. He alleged the manufacture and sale of large quantities of brake lining by the defendants, and that no reports or accounts have been rendered nor any payment of royalties made. His petition asked for an accounting and settlement and for a decree of specific performance of the licensed contracts for the future.

The Thermoid and Johns-Manville companies filed separate but almost identical answers. Defenses claimed that the contract was binding only under certain contingencies, and these contingencies never materialized; that Massey acquiesced for eight years in the non-performance or breach of contract by defendants, and is therefore equitably estopped from suing at the present time; that the complainants are in *laches*, and that the license agreements are a combination in restraint of trade and in violation of the Sherman Anti-Trust Act. The vice-chancellor decided against the defendants on all contentions. It is understood the Thermoid company has protected itself by special insurance against any loss which might occur through an unfavorable decision in this suit.

New Jersey Rubber Manufacturers Meet

The annual meeting of the Rubber Manufacturers' Association of New Jersey was held at the Stacy-Trent Hotel on December 11. The roll-call showed twenty out of twenty-one companies represented. A very enjoyable evening followed a choice and well-served dinner, and a very successful business meeting. Officers were elected for the ensuing year as follows: president, Charles E. Stokes, Home Rubber Co.; vice-president, Frank D. Voorhees, Voorhees Rubber Manufacturing Co.; treasurer, A. Boyd Cornell, Hamilton Rubber Manufacturing Co.; secretary, C. Dudley Wilson, Luzerne Rubber Co. The treasurer's report showed a healthy financial condition with a substantial balance on hand.

Trenton

The vacancies in the directorate of The Bergougnan Rubber Corporation, Trenton, New Jersey, caused by the death of Peter D. Thropp and the resignation of John Thropp, have been filled by the election to the board of Frank J. Wetzel and Newton K. Bugbee, both of Trenton. Although this company recently advanced prices 12½ per cent on all its products, it has experienced no falling off in orders, and is now operating at full capacity.

Fire department and water officials of New Jersey recently made an inspection of the hose making department of the United & Globe Rubber Co. and were shown how the hose is made from the time the raw products are received. After the officials had attended a demonstration of the standardization of fire hose couplings John S. Broughton, president of the company, invited them to inspect the plant.

The Empire Tire & Rubber Corporation of N. J. has been incorporated at Trenton with a capital stock of $10,000, to manufacture tires and rubber products of all kinds, to subscribe for and invest in stock, bonds, securities, etc., of corporations which own or operate plants for manufacturing purposes, or are organized for the purpose of constructing and operating street railways, tunnels, bridges and terminals. The agent in charge of the concern is W. Holt Apgar and the office is at 36 East State street. The incorporators besides Mr. Apgar are William N. Cooper and Thomas H. Baddeley.

The Grizzley Rubber Co. is now handling the products of the Murray Rubber Co. and the Miller-Steiner Co. The latter concern manufactures mechanical goods exclusively.

The equipment of the Semple Rubber Co. was sold on December 12 by Receiver John V. B. Wicoff. The William R. Thropp & Sons Co., rubber machinery manufacturer, purchased the mills, machinery and motors, while the automobiles and office equipment were sold to individuals. The Trenton Trust Co. owns the Semple company building. The Semple Manufacturing Co., a new concern, recently purchased from the receiver the tube making equipment of the old Semple company.

The Eureka Tire Co. of Trenton, reports increased sales for its Giant Cord line, and has arranged with the Hobbs Rubber Corp. of New York City and the Groth Rubber Co. of Brooklyn for the distribution of its product, and with whom it has placed large stocks. It has become necessary to add to the facilities of this company in order to take care of the increase in business.

New Jersey Notes

Brighton Mills, Passaic, New Jersey, tire fabric manufacturer, has elected to the position of treasurer H. J. Haigh, for several years treasurer of F. R. Henderson & Co., Inc., New York, N. Y., crude rubber importer.

Judge Charles F. Lynch in the United States District Court has dismissed a petition asking for the appointment of an equity receiver for the Old Hickory Tire Co., incorporated in Delaware, Maryland, and New Jersey.

The Lufbery Co., Inc., Elizabeth, New Jersey, has been incorporated to manufacture, import, export, and deal in rubber substitutes and sulphurets of antimony. The incorporators include Charles E. Bullinger and Wesley J. Moren who were associated with George F. Lufbery, Jr., before his death in 1918, and the new company will furnish the same uniform and dependable grades of rubber chemicals as did Mr. Lufbery. The officers of the company are: Charles E. Bullinger, president; Wesley J. Moren, vice-president and treasurer; and Percival G. Cruden, secretary.

Members of the Stockholders' Protective Association are arranging plans to gain control of the Smith Rubber & Tire Co., Saddle River, New Jersey, with a view to putting it on its feet again. It is said that it will require more than $250,000 to save the concern for the stockholders.

The Michelin Tire Co., Milltown, New Jersey, recently entertained the "Top Notchers" of the sales force with a banquet at the Hotel Klein, New Brunswick, and a sightseeing tour in New York City. The entertainment is an annual event of the Michelin company. The contest is held among the salesmen of the concern throughout the United States, the twelve salesmen who have the best sales being classified as "Top Notchers." One of the salesmen on the list this year hails from California.

The Howe Rubber Co., New Brunswick, New Jersey, reports expectation of doubling its sales record of 1922 during the coming year of 1923. In order to allow of carload shipments from the factory at New Brunswick to Dallas, Texas, a warehouse has been arranged for in the latter city. Much new equipment is being installed by this company to take care of additional business.

The Rubber Trade in Massachusetts

Manufactured Goods

Inventory taking and the holiday season have in some lines slowed down the rubber goods demand, but generally speaking business continues to be satisfactory in most lines. Footwear, weatherproofed clothing and druggists' sundries are all enjoying a busy season. Early and severe winter weather has brought a brisk demand for storm gaiters of the four-buckle and Russian boot types and most factories are operating at as near capacity as the labor supply permits. Advance orders for tennis lines have caused manufacturers to begin increasing their forces in those departments. Heel and sole demand continues brisk and competition keen at small profit margins.

Tire and inner tube production is above normal at this time of the year and the same is true of insulated wire, there being little diminution of the building boom. Advance orders for automobile topping are very gratifying owing to the extensive automobile program for the coming year. Hard rubber business is also encouraging. Mechanical rubber goods trade diminished a little toward the end of the year, but orders for future delivery are large.

Reclaimers are viewing advancing crude rubber prices with renewed hope, and the industry as a whole looks forward to the new year with optimism.

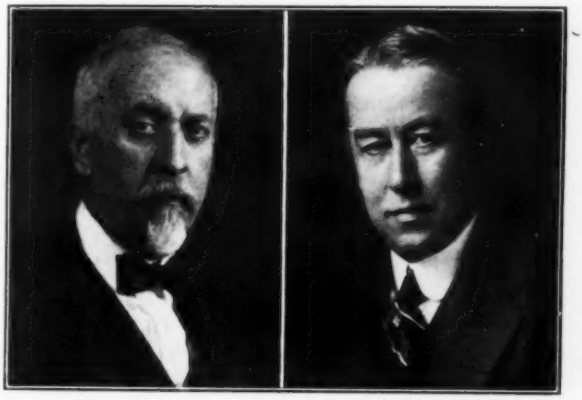
Boston

The Boston Boot & Shoe Club held its annual ladies' night at the Copley-Plaza Hotel on the evening of December 12, with a large attendance. Following the dinner and annual meeting presided over by James A. Gardner, president of the club, an excellent musical program was rendered, in charge of George W. Brown, vice-president of the United Shoe Machinery Corporation, who was recently elected president of the board of trustees of the New England Conservatory of Music.

M. M. Converse, president of the Converse Rubber Shoe Co., Malden, Massachusetts, was the principal guest and speaker at the annual meeting of the New England Shoe Wholesalers' Association, held December 20 in Young's Hotel. He stated that rubber shoe manufacturing conditions are better than for years, and emphasized the vital need of the restoration of New England's agriculture, its present condition being largely responsible for the high cost of living.

The officers elected were: president, E. Walter Smith, Worcester; vice-president, Stanley M. Lane; secretary-treasurer, Thomas F. Anderson; executive committee, John G. Magaw, Maynard Hutchinson and Alfred S. Foster—all of Boston; Byron S. Watson, Providence, Rhode Island, and H. F. Sawyer, Bangor, Maine.

Charles A. Coe, for twenty years eastern selling agent of footwear for the United States Rubber Co., at his own request has been retired from active service, effective December 1, last, and his



Charles A. Coe Edwin L. Phipps

former associate, Edwin L. Phipps, succeeds him, with headquarters at 130 Essex street.

Mr. Coe is 69 years of age. Since 1871 he has been selling footwear, both leather and rubber, and since 1896 rubber footwear exclusively. In 1895 he did some special work on wool boots for the United States Rubber Co., and the following year his firm, Charles A. Coe & Co., took the agency for the American Rubber Co. In 1902 he was appointed eastern selling agent of footwear for the United States Rubber Co. Mr. Coe has a host of friends in the New England rubber goods trade who wish him many years' enjoyment of well earned leisure at his home in South Essex.

Washington Cook, for a number of years associated in the management of the Boston branch store of the Gutta Percha & Rubber Manufacturing Co., has retired from the company, and R. J. Barker, lately manager of mechanical sales for the United States Rubber Co., Boston, succeeds him. The company's headquarters remain at 71 Pearl street.

Some 50,000 bales of Egyptian cotton, either direct from Alexandria or transhipped from Manchester, England, were received at this port in eight or more ships during December, practically all being for mills in Massachusetts. One cargo alone consisted of some 13,650 bales, valued at nearly $4,000,000.

The Grow Tire Co. has discontinued its branch at 158 Summer street, and is handling all local business from its office at 323 Columbus avenue, Boston.

The Clifford Co., with offices at 185 Summer street, has placed on the market a new line of rubber heels and soles. "Ace" rubber heels, crêpe rubber sport soles and cement under the trade name "Clico" are the products. James J. Clifford is president and treasurer of the company and I. F. Hunt is secretary. Clico soles have a few distinctive features. They are made in gages from ⅛ to 3/16-inch. All heels are furnished separately—not molded as part of the sole. The soles are made in both one and two units. Single unit soles are cemented and stitched through to the surface. Two-unit soles have the first half cemented and stitched and the second half cemented to the first, covering the stitches. A special cement insures a perfect job.

L. H. Butcher, Co., Inc., importer and dealer in rubber maker's colors and chemicals, announces the appointment of George E. Reinhalter as eastern New England representative with headquarters in Boston.

Massachusetts

H. H. Replogle has resigned as manager of the intermediates division of the National Aniline & Chemical Co., 40 Rector street, New York, N. Y., in order to assume the sales management of The Wamesit Chemical Co., Lowell, Massachusetts. The Wamesit company is a large manufacturer of lactic acid, lactates, and lactic acid compounds.

George L. Lawrence, Jr., of Melrose, for the past twelve years connected with the Boston Rubber Shoe Co., Malden, resigned, effective December 16, to become factory manager of the reorganized Tyer Rubber Co., Andover. The Tyer company is perfecting plans to equip its unoccupied plant for the manufacture of certain lines of rubber footwear. It has recently issued $25,000 of a total of $30,000 authorized, no par value, and has also to issue $500,000 of 6 per cent preferred stock. W. E. Piper is treasurer.

The Easthampton Rubber Thread Co., Easthampton, Massachusetts, has increased its authorized stock from $400,000 to $1,200,000, by ordering a 200 per cent stock dividend to stockholders of record December 7. The surplus on November 30, last, was $753,877.

The upper structure above the completed foundation of the new press room building being erected for the molded hose department of the Boston Woven Hose & Rubber Co., Cambridge, Massachusetts, is rapidly taking shape and will soon be ready for the installation of two lead presses, their being accommodations for five presses in all.

New England

First Rubber Factory in Maine

The Pine Tree State Rubber Co., operating the pioneer rubber factory in Maine, has been incorporated at Lewiston, Maine, with a capital of $200,000. The officers are: president and treasurer, Frank W. Hodges, Malden, Massachusetts; vice-president and factory manager, Theodore D. Cowen, also of Malden; clerk, Carl F. Getchell, Lewiston, Maine. The board of directors consists of the above officers and F. R. Merritt, Haverhill, Massachusetts.

Frank W. Hodges, president and treasurer of the company, is an experienced rubber footwear man, having until recently been foreman of the light rubber shoe making department of the Converse Rubber Shoe Co., Malden, Massachusetts.

Theodore Cowen, vice-president and factory manager, is the son of the late Robert Cowen, for many years vice-president and superintendent of the Boston Woven Hose & Rubber Co., Cambridge Massachusetts. He had been associated with the technical department of that firm for about two years.

The company has purchased the brick woolen mill at Sabbatus near Lewiston and is installing machinery for the manufacture of rubber heels and molded rubber goods. Operation will be begun with forty hands and it is expected to increase the number from sixty to one hundred.

The Rubber Trade in Ohio

Forty-Three Million Tires for 1923

While many factors can easily increase the consumption of tires, W. O. Rutherford, vice-president and director of sales of The B. F. Goodrich Co., estimates that 1923 will see a minimum of 43,500,000 automobile tires manufactured in the United States, as against 37,000,000 which he estimates have been made during the past year. Some 30,000,000 will be used for replacement purposes, on the basis of two and one-half tires to a car. At least 12,000,000 tires will be needed on the 3,000,000 automobiles which he estimates will be manufactured next year. Approximately 1,500,000 of the total will be sent to foreign fields.

These are all minimum figures, Mr. Rutherford states. Many things can work to increase the figures but it seems impossible to lower them. At present the public is still buying cautiously. Many are operating cars without spare tires. The desire on the part of half of the motorists to have spares with their cars will mean an additional 6,000,000 for the year.

Dealers are operating on a low inventory basis. The placing of an average of ten additional tires in stock on the part of the dealers of the country alone will mean another 1,000,000 tires required.

Motorists have been using old tires to the last extremity and the buying of one extra tire next year by each motorist, due to better business conditions and freer spending, will make another 12,000,000 very easily.

Tire Price Situation Uncertain

There is no unanimous opinion regarding the future of tire prices. In the face of increases by the Kelly-Springfield Tire Co. and The Fisk Rubber Co., Harvey S. Firestone, president of The Firestone Tire & Rubber Co., is reported to have announced that his company does not contemplate making any increases.

Other rubber companies are reported to have printed new price lists with revisions upward, but this cannot be confirmed. Every leader in the industry with the exception of Mr. Firestone has refused to make any statement regarding the tire price situation.

While the general public opinion is that tire prices will advance with the turn of the year, definite information regarding the plans of the leaders is lacking. While increased prices are generally conceded to be justified and desirable it is too much to say that they are definitely in sight.

Radio Parts Manufacturers

Output of radio telephone parts by the rubber industry here has mounted with the coming of cold weather and promises to be larger during the present season than last, when the new industry swept the country.

The Goodrich radio department is running very close to capacity and some expansion may be undertaken during the present winter.

The Trump Rubber Co. which entered this line early last year reports that its output thus far this season is larger than during the corresponding period last year.

The American Hard Rubber Co. officials state that the business thus far this year leads to the opinion that further increases are to be expected during 1923.

As in previous developments of new ideas, the rubber industry here has overlooked no opportunity of getting into the new field, with the result that it is estimated that more than 50 per cent of the rubber parts of American radio telephones are now made in the Akron territory.

Production has also been started in the Bacolite Co. plant, formerly the Avalon Rubber Co., where parts are being made with a new material which the company expects will replace hard rubber to some extent. The process of production is secret and under patent.

That the business will prove to be seasonal, that is, heavy during the winter and light during the summer months for several years, is now generally expected.

General's Dealer Policy

Closer contacts between manufacturer and dealers is one of the things upon which The General Tire & Rubber Co. sales policy depends. Company officials have recently held meetings with dealers in various sections of the country and have also held a large meeting of all dealers and salesmen at Akron. During the entire year there have been few months that the company has not held some meetings with its representatives in various states, important officials of the company always attending.

In this way, not only do the officials give the dealers their own impressions regarding salesmanship and policy, but information regarding the state of the trade comes directly to the officials who help to mold the policy of the company.

Much of the company's success has depended upon its unique merchandising policy, in which exclusive dealers with exclusive territories is the keystone, and the personal contact established between company officials and the distributers has done a great deal to obtain the best results from the selected dealers.

Lambert Cushion Tire Progress

Guy M. Collette, general manager of the Lambert Tire & Rubber Co., which was taken over by the present organization about three years ago, was formerly with the Firestone company. The gross business of the Lambert company for the past year is estimated at $800,000, as compared with $450,000 during 1921, and with new production facilities installed in the new and old plants, it is believed that the $1,000,000 mark will be reached next year.

Guy M. Collette

The first addition to plant and equipment was completed early last spring, bringing production to near the 200 mark. The second unit is now being placed in production and will bring capacity to approximately 375 cushion tires a day. The present output is very near the 300 mark. During the past month business received by the company was 270 per cent over that received during the same month last year.

Akron

J. G. Robertson has retired as treasurer of The Firestone Tire & Rubber Co. and has been succeeded by J. J. Shea, formerly general auditor. Mr. Shea was succeeded by H. H. Hollinger. Mr. Robertson will devote his time to the subsidiary interests of the Firestone company, including general supervision of the Firestone Steel Products Co.; the Firestone-Apsley Co., of Hudson, Massachusetts; the Canadian plant at Hamilton, Ontario; the crude rubber mills at Singapore, and all American and foreign branches.

J. G. Robertson

The Mohawk Rubber Co. expects to increase production during the next six months so that the entire factory space will be in production at capacity. During the past year business has increased gradually but constantly until the present output is above that of the factory capacity previous to completion of buildings constructed during the late boom period. Dividends have been comfortably earned during the past six months.

The Trump Rubber Co. has gone into the production of cord tires following completion of an additional unit at its plant. The present capacity of the new unit is approximately 50 tires a day, although provision has been made for increasing this during the coming year. The firm started the production of belts and accessories in the former Denmead Rubber Co. plant in East Akron a year ago. Steps have been taken to incorporate the business early during the new year at approximately $200,000, none of which stock is to be offered for sale, according to R. M. Trump, a member of the present partnership. Production of women's and men's belts continues above 22,000 a day.

The Leo Myers Co. will erect a new building to cost in the neighborhood of $100,000 built near the A., C. & Y. railway on Forge street to be used for warehouse purposes to replace the one located on Furnace street which burned down last summer. The company deals in scrap rubber and moved its warehouse to Akron from Chicago, Illinois, early in the present year.

E. M. McIntosh, of the export department of The Goodyear Tire & Rubber Co., is among the men who recently returned from a trip through the Orient. C. M. McCreary, of the same company, is at the present time in Europe studying truck and motor bus conditions.

Frank B. Harrington, for the past ten years associated with the rubber industry in Akron, has been named manager of sales by The Star Rubber Co. He has been connected with the sales departments of The B. F. Goodrich Co., The Miller Rubber Co. and the Dayton Rubber Co.

The Kahnheimer Co., 515 Ohio State Bank Building, Akron, has been started by S. F. Kahnheimer, its president, to deal in crude and scrap rubber, and within the next six months plans to incorporate. Mr. Kahnheimer was for nine years with H. Muehlstein & Co., Inc., as director and representative.

Ohio

Definite plans to increase tire production from 300 to 1,000 tires daily have been made by the Republic Tire & Rubber Co., of Youngstown, according to W. N. Fitch, general manager. The tire output is now concentrated at the Youngstown plant following the closing of the department at the Canton plant. Additional equipment for the production of mechanical goods has also been installed and the output is being increased gradually.

The recently opened Tip Top Tire Repair Shop, 7050 East Broadway, Cleveland, Ohio, represents one of the most thoroughly equipped vulcanizing establishments of that vicinity. B. E. Frantz, who has had much experience in tire repair work, and who heads the organization, has installed throughout his plant machinery manufactured by The Akron Rubber Mold Co.

The Erie Tire & Rubber Co., Sandusky, Ohio, has appointed C. O. Brandes export manager, with headquarters in Cleveland. Mr. Brandes was formerly expert manager for The Firestone Tire & Rubber Co., Akron.

The Rubber Trade in the Midwest

Manufactured Goods

The demand for all lines of rubber goods, and particularly tires, inner tubes, and mechanicals generally, is sufficient to keep the factories going at a very satisfactory rate of production. Fuel and transportation facilities have shown marked improvement.

Midwest Rubber Association Banquet

The regular monthly meeting and fourth annual banquet of the Midwest Rubber Manufacturers' Association will be held at the Hotel Morrison, Chicago, Illinois, on Tuesday, January 30, 1923, at 6:30 p. m. Tickets will be $10.

The banquet committee has prepared an attractive program that will surpass by far any previous function given by the association, and therefore a large attendance is expected.

Midwestern Notes

W. H. Salisbury & Co., Inc., 308 West Madison street, Chicago, Illinois, is manufacturing its various lines of rubber goods in its new and modern factory at 411 North Michigan avenue. The officers include: M. B. Salisbury, president; H. H. Salisbury, vice-president and treasurer; and J. C. Kettner, secretary. T. R. Claffy is sales manager.

The United Shoe Machinery Corporation, Boston, Massachusetts, will manufacture shoe findings such as tacks and nails

at the branch factory it will establish in the recently purchased plant of the Haynes-Langenberg Manufacturing Co., St. Louis, Missouri.

The Latex Tire & Rubber Co., Fond du Lac, Wisconsin, has opened a branch store at 321 Wells street, Milwaukee, in charge of Harry H. Muench, manager. Mr. Muench is also manager of adjacent territory. Both wholesale and retail business is reported good in this district.

The Axtell Auto Accessories Co., 1507 Michigan Boulevard, Chicago, Illinois, a wholesale jobbing concern, took over during the summer just past the factory distribution in Chicago and Cook County on "Corduroy Cords," tires manufactured by the Grand Rapids Tire and Rubber Corporation, Grand Rapids, Michigan. Arrangements are now being made to open other distributing branches. Joseph E. Axtell is president of the Axtell company and also of The Illinois Rubber Co., a subsidiary concern serving Illinois dealers.

The Rubber Trade on the Pacific Coast

Manufactured Goods

Heavy rains beginning early in December, and noted in some districts as the seasonal maximum for thirty years, sent retail dealers on the Pacific Coast scurrying with orders for rubber footwear, and raincoats to the coast branches of the leading eastern rubber goods manufacturers. One concern had to keep a score of extra men in its warehouse for a fortnight packing goods to meet the rush orders. Although well stocked, some of the branches were quickly cleaned out of wet season rubber goods and had to forward urgent appeals to the East for more supplies.

Due to unfavorable weather, tire sales have eased up noticeably at all the chief points on the Pacific Coast, but the tire factories have not lessened production to any considerable extent. Some filling spring dating orders are very busy. Generally speaking, mechanicals are selling well and supplies for oil and mining needs are still in strong demand. In druggists' sundries and general automobile accessories a good trade is reported.

Los Angeles

George Bellis, well-known in the tire trade, will have charge of the new Lee Tire & Rubber Co. branch in Los Angeles. The company has bought a site having a 120-foot frontage on Figueroa street, near 18th, and will erect a 2-story class A building thereon, with up-to-date equipment.

The B. F. Goodrich Rubber Co. Los Angeles branch reports exceptionally brisk business. Tire sales have been remarkably good, and even a better report can be made for mechanicals. The vacancy of district manager, will, it is expected, be filled very shortly. Mr. Carroll, who held that position for more than a year, is now in Japan looking after the Goodrich plant there.

J. B. Magee, Los Angeles branch manager of the United States Rubber Co., completed on December 15 an extensive trip through the Southwest, during which he called on the company's principal selling agencies in that section. He reports trade conditions very satisfactory and the 1923 prospects as excellent.

Tire production is running strong at the plant of the Goodyear Tire & Rubber Co. of California, in Los Angeles. The works reported the daily output on December 15 as 3,200 casings and 3,700 tubes. The 1922 daily average was 3,001 casings and 3,553 tubes. An increase for December over the preceding month was noted in the output of vulcanizers' repair materials.

San Francisco

An important event in rubber circles was the recent annual meeting in San Francisco of the branch managers of the United States Rubber Co. Over a score from all the Western states included in the Pacific Coast division attended, the session being presided over by J. B. Brady, division manager. The latter complimented his aides on the uniformly fine showing made by them for 1922 and outlined an aggressive merchandising plan for 1923. Three days were spent in business conferences, and at the conclusion a banquet was tendered the visiting managers at the San Francisco Golf and Country Club.

Although this is ordinarily the quieter season for most lines in the rubber trade on the Pacific Coast, the Pioneer Rubber Mills' big factory at Pittsburg, Contra Costa County, California, is not only working on full time but increasing its force steadily and making further extensions to its plant. Business has shown a marked increase for 1922, both in units of production and gross value, and the management, which has remained unchanged for a long while, expects 1923 will show a great expansion in its output.

The San Francisco branch of The B. F. Goodrich Rubber Co., of which W. T. Powell is manager, will soon be housed in a new 5-story reinforced concrete building now being erected on Second street, between Brannan and Townsend. It will be equipped with every modern convenience and have a spur of track on which two cars may be loaded or unloaded at a time. The company now has temporary quarters on Howard street.

The American Rubber Manufacturing Co., with San Francisco office at 417 Market street and general offices at Park avenue and Watt street, Oakland, California, is building a one-story factory addition, 135 by 100 feet, of concrete construction, to be used for its rubber hose room. Two 48-inch Farrel mills now on the way from the East will also be installed in the addition built in 1920. The company specializes in mechanical rubber goods, especially heavy goods such as conveying belts for gold dredging, oil suction hose for loading and unloading steamers, and cotton rubber-lined fire hose for cities, mills, and mines. Through all of the so-called depression this concern has been operating 16 hours daily and is still behind on orders. N. S. Dodge is president.

The Northwest

The Columbia Tire Corporation's new plant at Kenton, a suburb of Portland, Oregon, is ready for occupancy, and production, it is stated, will begin early this month. The company boasts of having one of the most modern tire factories in the country. According to R. A. Wurzburg, president, 250 men will be employed, and the daily output will be 500 tires and 500 tubes. Cords and tubes of all sizes will be made, but only 30 by 3½ fabrics. The company's Portland office and service station will be at Broadway and Burnside street. A branch is being established in Seattle.

The Southwest

L. A. Hilton, manager of the United States Rubber Co's. San Diego branch, has been transferred to the Long Beach branch and has been succeeded by O. M. Campbell. The latter recently attended the conference of United States Rubber Co. Pacific territory managers at San Francisco, accompanied by George W. Miller, manager of the new branch in Phoenix, Arizona.

The first of several large shipments of new machinery and additional tire manufacturing equipment has just been received by The Spreckels "Savage" Tire Co., San Diego. This includes a number of 15-foot press vulcanizers in addition to other tire building machinery of the most advanced type. The Spreckels company has added still another tire to its line, known as the "Trailmaker." This is a full-sized black cord of high quality and has an attractive non-skid tread design. It is made to compete with cord tires of other makes on the market, and it is excelled only by its big brother, the "Aristocrat Savage Cord." The Spreckels 1923 campaign, which was outlined at the recent conference of branch managers, includes the profit participation plan for dealers, said to be a real innovation in tire merchandising.

The Rubber Industry in Great Britain

By Our Regular Correspondent

Institution of Rubber Industry

At the Manchester meeting in November a paper illustrated with lantern slides was read by A. F. Baillie, of the Shell-Mex Co., on fuel oil. During the last coal strike some of our rubber works turned to oil as fuel for raising steam, but with the cheap coal now available there is loss in use of oil, from a strictly economic standpoint, and no rubber works are now using it.

This paper was followed by a discussion on rubber manufacturing difficulties opened by the chairman, J. H. Mandleberg, who confined his remarks to spreading, which branch, he thought, contains most of the difficulties found in rubber manufacturing in an accentuated form. The decomposition of rubber and many of the reactions of rubber take place at the surface and in spread goods the ratio of surface to mass is very high, therefore in rubber proofing they get many of the rubber difficulties multiplied.

Mr. Mandleberg said that much of the rubber machinery used is imperfect, the spreading machine being the most useless invention that has ever come out of an engineering shop; it is ill-adapted to its purpose, but everybody goes on using it, and he hoped that during the discussion some one would suggest some better way of applying rubber to textures.

The vexed question of variability wanted elucidation, and other topics which he thought might receive notice were the exact mechanism of vulcanization; acceleration, organic and inorganic; and the exact effect of carbon black on rubber.

Captain F. J. S. Gray said that while spreading machines are much the same as years ago they vary in their lightness or heaviness of touch. Complaints have frequently arisen in the past which have been found to be due to the use of too much chloride of sulphur in the cure. Tetrachloride of carbon has the advantage over bisulphide of carbon in being noninflammable, nonexplosive and not nearly so detrimental to health. It also has the advantage of nearly 50 per cent slower evaporation, which gives more time for the chloride of sulphur to penetrate, thereby producing a better article. With regard to carbon black it seemed extraordinary that the people who rushed to market it in England advertised on the same page that carbon black is inert and then again stated that there is about 35 per cent increased or quicker vulcanization. After some months they suddenly became aware of this incongruity and an alteration was made. It was really a chemist's question, the good effect being due to the very fine subdivision of the particles, a view which had the support of later speakers.

E. Healey, who stated that this was his first appearance at a meeting of the institution, spoke on the human element, which had been referred to by Fordyce Jones. The question of the human element as applied to the workers, quite apart from the training of a technical staff, is one of the most important things in a rubber factory. Reference had been made to workers getting fatigued and losing interest in their work. He did not want to boast of what they have done at Leicester, but during the last fifteen years they have endeavored to make every man interested in his work. This is important because carelessness among workers is something extraordinary, but with interest in the work they have found that waste and defects have been enormously reduced. With regard to calendering versus spreading he thought that in calendering there is a danger of bottling up air; they have found this difficulty in connection with thread sheets and other fine work of that kind.

Herbert Rogers thought the discussion was a useful one. Most of them had notes on various points which might be useful to somebody else and in having such a discussion they would be helping others. There was no need to refer to work which might be of special importance to particular firms. Spreading is as difficult now as it was with Macintosh and Hancock, who between them invented the spreader, a machine they cannot get away from today. Besides air bubbles in calendering there are many other difficulties. In quite a thin coat of spreading there are several coats of rubber which cannot be put on with a calender, and if there is a blemish in one coat it will be covered up by the next coat. His experience was that trouble with proofing arises if there is too much rubber. Actually a certain amount of substitute prolongs the life of an average proofing if it is properly vulcanized. With regard to the cold cure he did not know yet where the proper cure comes in. Some old samples which had been cured with bisulphide containing 5, 10, and 15 per cent of chloride of sulphur and all run over the curing roller at the same speed, today look to be in just the same condition. Continental makers produce a proofing entirely different to what is made in Great Britain, being nicely finished and with a very smooth surface. Whether it is done by the cold cure or by the vapor process he did not know and would like to find out.

H. Ferrario, a cloth maker, said that he had been in some works and noticed that the majority of spreading machines are not sectionalized, and that heavy and light proofings go on the same machine. It is not easy to get at the facts because the majority of rubber people will not allow any one from outside to see the machines. Proofing today is a matter of price and it is the cheap stuff that is selling. The spreading machine may be crude, but it is the only one which will do the work. If proofing goes wrong the cloth supplier is sent for and blamed though he was not allowed to see any of the proofing work in progress. With regard to a certain cause of complaint a little time back it had been agreed on both sides that the cause was the alkali of a mineral dye, though each side persisted that the trace which they admitted responsibility for was not the cause of the trouble. He honestly thought that if the chemist had been left out of the discussion an agreement might have been reached.

The chairman in replying referred to the Peachey process, mentioned by Fordyce Jones, and said that he did not like the two gases. He thought they ought to know more about the action of the sulphur dioxide on the cloths, on both the dye and the fiber. There was one thing he wanted to say and hoped the press would note. He hoped these discussions would become frequent, but he also hoped that no one would give away or even refer to any process which could be considered in the nature of a trade secret of his particular firm. Whether they believed in the existence of trade secrets or not it would do a great amount of harm and no good if reference were made to any so-called secret process. Problems common to all were more than sufficient to occupy their time.

Manufacturers' Association Head Visits Middle East

E. Healey, president of the India Rubber Manufacturers' Association, and also vice-president of the Rubber Tire Manufacturers' Association, is probably the most traveled of the leaders in the British rubber industry. At an early age he was doing strenuous work in New Zealand, and now after thirty years of service with the firm of W. & A. Bates, Limited, of Leicester, where he is now the controller of its destinies, he is just off on another for-

eign business tour which is to include India, Burma, Siam, the Malay States, Java and probably Japan.

The firm of W. & A. Bates, Limited, has long been known in the india rubber thread trade, Leicester being the home of the elastic webbing industry, and it is interesting after all that has been said by the plantation rubber advocates to find Mr. Healey insisting that only Brazilian Pará can be used in thread manufacture.

The new export duties on rubber in Ceylon, the Malay States and the Straits Settlements are not altogether to Mr. Healey's liking, as he thinks they will tend to restrict trade instead of promoting its expansion. In this matter he has spoken out strongly in the letter sent by himself and colleags of the India Rubber Manufacturers' Association to the Stevenson Committee.

Financial Notes

While some of our important manufacturing companies show in their last reports a great improvement on the preceding ones, others are taking a longer time to reattain their normal prosperity. Thus the India Rubber, Gutta Percha & Telegraph Works Co., Limited, though it has done better, shows nevertheless a loss of £94,406. The directors state that the main cause of this loss is further depreciation in stock values, a secondary cause being the conditions surrounding the tire section of the business brought about by intense foreign competition. The reserve is again drawn upon to wipe out the deficit and the fund is now reduced to £140,000. Heavy though the loss is, it is much below that of the former balance of £445,461 for eleven months only. However, a criticism in one of our financial papers suggests that something must be wrong with working conditions and that shareholders are justified in calling for a thorough investigation.

The Greengate & Irwell Co., Limited, a fusion of two Manchester private firms—Frankenburg & Sons, Limited, and the Irwell & Eastern Rubber Co., Limited—was registered in November, 1919. In the last report for 1921 it showed a loss of £61,514, but against this was placed £74,119 which it was hoped to recover out of excess profits duty paid by the two private firms. The announcement, however, has recently been made by the directors that the claim has been definitely rejected by the Board of Inland Revenue, and they propose to deal with the finances at once. The proposal is to write down the capital from £800,000 to £725,000 by canceling 4*s*. per share on the 375,000 ordinary shares, leaving them at 16*s*. each, and at the same time to divide the 25,000 unissued ordinary shares into 31,250 ordinary shares of 16*s*. each. The only public issue is one of £400,000 preference shares, the interest on which has been paid.

Siemens Bros. & Co., Limited, the well-known electrical and cable firm, announces that it is not in a position to declare a dividend on the ordinary shares. A year ago there was a dividend of 1*s*. per share and the present default has caused some surprise because this class of business has continued good all through the slump.

British Trade with India

The report for the last fiscal year ended March 31, 1922, contains some noteworthy alterations in the imports of rubber goods showing a decline in the supremacy which the United States attained during the war years. The total imports of rubber tires were valued at 96 lakhs of rupees during the last year against 141 in the previous year. The imports from the United Kingdom fell from 35 to 26, the United States from 37 to 21, while Italy fell from 44 to 12, changing from the first to the fourth place. In the first three months of the current year the import of tires has increased and in this period the United States came first, France second, and the United Kingdom third. Presumably it is the well-known greater wear and tear of tires during the hot months that has caused the increased imports.

The Goodyear and Fisk tires retain their popularity, but the Dunlop and Michelin are strong competitors. Quite recently, also, Germany has reentered the Indian market and we may expect their business to increase owing to the cheapness of their tires and other goods.

There are no rubber works in Bombay and only one, of no great magnitude, in Calcutta. The retail rubber shops as we know them in England are not found in India and the business is done in the bazaars by import firms specializing in rubber goods. Several of the large manufacturers have their own offices and staffs in Bombay and Calcutta, the Dunlop company leading the way, having branch offices also in many of the smaller towns.

Well-Known Tire Manufacturer Dies

Cuthbert Burnett, who has died at the age of 77, was well known in recent years in connection with motor tires which he commenced manufacturing first at Limpley Stoke near Bath, later removing to the Yerbury Mills, Trowbridge, Wiltshire. An engineer by profession, the greater part of his career was passed in connection with coal mining in the north of England, and it is not generally known that Burnett of the Burnett Tyre Co. was identical with Burnett of the well-known Burnett coal washing plant.

NORTHWESTERN RUBBER CO.'S SALES OFFICE

The sales office of the Northwestern Rubber Co., Litherland, Liverpool, rubber reclaimer, is now with Buckleton & Nourry, Ltd., 13 Rumford street, Liverpool, where orders and inquiries should be directed.

ANOTHER RUBBER LATEX COMPANY

The Rubber Latex Co., Limited, 7 and 8 Great Winchester street, E. C. 2, London, England, will carry on the business of general merchants, manufacturers, importers and exporters, brokers, agents and dealers in rubber, rubber latex, and rubber goods of all kinds. It will also handle asbestos and asbestos goods, as well as leather and linoleum substitutes, paper, pulp, papermaking materials, etc. The first directors are: D. F. L. Zorn, Ravensdeane, Grove Park, S. E. 12; and J. Fairbairn, 12, Chepstow Place, W. 2, both in London.

TYPKE & KING, LIMITED

Among British organizations which specialize in the manufacture of chemicals for the rubber and allied industries no company is better known than Typke & King, Limited, Crown Chemical Works, Mitcham Common, Surrey, England. Established in 1883, this company's plant has, from small beginnings, steadily developed, until today the property, with its various buildings, includes more than eleven acres.

Since the death of W. R. King, his associate, P. G. W. Typke, has continued in office, assisted by the following executives: W. W. King, A. P. King, H. E. King, and W. J. Peter. The company's products, including golden and crimson antimony sulphides, are being exclusively handled in the United States by L. H. Butcher Co., Inc., 239 Front street, New York, N. Y.

RUBBER MANUFACTURE IN EGYPT

Egypt for the past 11 years has been maintaining a factory of some importance for the production of rubber goods. The concern known as the Société des Industries Egyptiennes, Sahel El Ghelal, Boulac, Cairo, was reorganized in 1916 as a limited liability company and is now a subsidiary of the Banco di Roma, of Rome, Italy. The company has agencies in Alexandria and Port Said, and imports raw rubber and other materials from England and Belgium, and a small quantity from France. The value of the output has been estimated at £E20,000 annually, and the following articles are manufactured: rubber sheets and plates, carved

and molded; technical articles for industrial purposes; rubber hose and tubings; articles for hospitals and pharmacies; and tires, tubes, etc., for motor cars and cycles.—*Commerce Reports.*

The Rubber Trade in Europe

By Our Regular Correspondent

Austria

The Globus Gummi-und Asbestwerke G. m. b. H, Vienna branch of the firm of the same name in Ahrenböck near Lübeck, has dissolved.

The Gummiwarenfabriks A.-G., Vienna, is a new firm, formed to manufacture all kinds of goods of rubber, gutta percha and the like.

Denmark

During the first six months of 1922, Denmark imported 66,900 kilos of rubber, compared with 184,800 in the corresponding period of 1921. For the first half of 1922 she imported 20,600 kilos of footwear compared with 18,300 kilos; for the similar period in 1921, 262,600 kilos of bicycle tires against 177,300 kilos; 388,300 kilos of automobile tires against 189,500 kilos; 44,700 kilos of cycle tubes and 21,900 kilos of automobile tubes against 19,400 kilos and 11,400 kilos, respectively; 53,400 kilos of other tubing against 26,500 kilos; other rubber goods with fabric, 98,200 kilos against 81,200 kilos; other rubber goods without fabric, 82,900 kilos against 66,300 kilos.

France

The Société Générale pour la Fabrication des Matières Plastiques reports a loss of 328,671 francs over the year's working. Owing to general conditions the demand for the company's products declined so that one of its two factories had to be closed for seven months and did not reopen until April. The loss shown above will be amortized by a deduction from the reserves amounting to 350,000 francs.

The Société Française des Produits J. I. D., Malakoff, Seine, has been formed for the purpose of manufacturing and dealing in rubber and chemical products.

Germany

To a superficial observer Germany continues to present a prosperous appearance: factories are working to capacity, there is little unemployment, and companies turn out big dividends. However, the prosperity is mainly fictitious. The mark is practically valueless, and the question of securing capital for the purpose of buying raw materials for the rubber industry is becoming more and more vexatious. The scarcity of fuel is also cause for anxiety and many factories would have closed had it not been possible to obtain English coal.

The constant advance of prices to keep pace with the falling mark is resulting in a slackening of the rush to place orders so noticeable some months ago. In some branches, notably the surgical rubber branch, prices no longer go up, say, 10 per cent at a time, but from one week to the next one or two thousand per cent is added to the basic price which is that of last year. In fact, by the time a paper has published an increase this is no longer valid as a new increase has already been decided upon.

Just as a curiosity, the latest increases are quoted, and will undoubtedly be out of date by the time this appears in print. The surgical hard and soft rubber goods factories have decided that from November 22, additional charges on seamless goods are to be 10,000 per cent; preservatives and seamless pessaries 7,500 per cent; sheet rubber goods 6,000 per cent; hard rubber goods 6,000 per cent; mineralized rubber goods 6,000 per cent; catheters 6,000 per cent; bathing caps, tobacco pouches and sponge bags 4,000 per cent. The price for all kinds of tires has been raised 50 per cent; insulated wires are from 25 to 90 per cent higher according to gage and type of insulation; technical rubber goods are 33⅓ per cent higher and terms of payment are very unattractive for the buyer.

The uncertainty in the matter of prices, then, as well as that of delivery, is causing buyers to hold off more or less. However, factories have been able to work as usual as many still had old orders to go on.

The decrease in orders is not due to lessened local demand alone; the export business is also suffering, for in many cases the German prices have exceeded the world market prices so that German goods manufactured from imported raw materials are no longer as attractive to the foreign buyer as they were. Then, too, several foreign countries, particularly Spain and Italy, have revised their tariffs and are imposing prohibitive duties on German goods.

All these circumstances, in addition to the increasing cost of labor, are causing the greatest anxiety, and manufacturers are asking themselves how much longer they will be able to keep going; many, in fact, are seriously considering the advisability of restricting their output.

Company News

The need for capital is well illustrated by recent decisions of some of the foremost German rubber manufacturers. Thus the Continental Caoutchouc-und Gutta-Percha-Compagnie, Hanover, intends to increase its capital by 180 million marks. The Vereinigte Gummiwaren-Fabriken Harburg-Wien, Harburg, now known as Harburger Gummiwarenfabrik Phœnix früher Vereinigte Gummiwaren-Fabriken Harburg-Wien, has raised its capital from 33,000,000 marks to 77,000,000 marks.

The Mitteldeutsche Gummiwarenfabrik Louis Peter, A. G., Frankfort-on-the-Main, will increase its capital to 190,000,000 marks ordinary shares and 20,000,000 marks preferential shares by issuing two sets of stock up to 80,000,000 marks each.

The Kabelwerk Aktiengesellschaft, Hamm, Westphalia, has been founded with a capital of 2,000,000 marks. The firm will manufacture and sell cables, wires, insulating rods and the like.

The Titan-Caoutchouc Gutta-Percha und Chemische Werke, A.-G., has been established at Horrem with a capital of 20,000,000 marks.

Rubber Heels and Soles

The impossible prices demanded for leather have caused dealers to show extraordinary interest in rubber heels and soles which, though expensive enough, are cheap in comparison with the leather goods. Big stocks of rubber heels or soles cannot be kept on hand as deliveries from the manufacturers are not only slow but limited. As a rule solid rubber heels are now in demand, and while there was not much of a market for rubber soles, the price of leather has increased the demand for the rubber sole so that this is almost as much in request as the rubber heel. Odds and ends left over from the manufacture of rubber, balata and leather belting are used for the soles.

Rubber heels and soles are no longer put up in packages of dozens, but are sold loose to dealers in order to save the costs of packing. A sign of the time is this, that vulcanizing works have taken up the repair of rubber soles and even of heels besides the repair of tires.

Various methods have been tried in order to increase the durability of the rubber heels and soles, but without much success.

As for attaching the heels and soles to footwear this is sometimes done by the purchaser himself, but generally he requires the services of the shoemaker, who charges from 60 to 100 marks for attaching a pair of heels or soles, which is not considered exorbitant, as rubber cement is dear and a quantity of it is required, to say nothing of the man's time and labor.

The Rubber Trade in the Far East

By Our Regular Correspondent

Malaya

Rubber Restriction a Law

THE Federal Council at Kuala Lumpur unanimously passed the Rubber Restriction Bill and this became law on November 1. During the discussion it was suggested that all power of control should not go out of the hands of the Federal Council and that Malays and Chinese should be on the local committee.

In his address, the Chief Secretary, the Honorable W. G. Maxwell, criticized the lack of organization in the rubber planting industry here and urged that the utmost attention be given this question. He also reminded his hearers that the measure of the success of the scheme would be the returns of the exports of rubber from Malaya toward the end of next year and the beginning of the year after, and that accordingly this should be kept in mind when claims for exemption for various reasons were put forward.

Regarding a question concerning the working of the duty in the case of latex, consideration would be given to the desirability of total or partial exemption.

CHANGES IN ORIGINAL BILL

Some changes were made in the draft already published. Thus there was an amendment to allow total or partial exemption to be granted from the rules in special cases, to secure that the rules be placed before the Council before being brought into force; that no decision of any official or any other person appointed under the Enactment with regard to the quantity of rubber that may be exported could be called into question in any court of law.

The original definition of rubber in the enactment was: latex from plantation Pará rubber trees whether treated or untreated, but not goods manufactured from rubber. The clause concerning manufactured rubber was deleted, for the sheet rubber cut into certain forms such as soles of shoes might well be claimed to be rubber goods, and it was considered more advisable to leave in the hands of the Government the discretion of deciding such claims for exemption.

Coupons will be issued to producers. The backs are blank and will be used for recording the stamp of the issuing office and for the endorsement which the local buyer will be asked to make of his purchase from the Malay small holder and of any further transactions in this country, before the coupon actually reaches the Custom House. The coupon will be given up to the Custom House and finally returned to the office from which it was issued.

The census recently held enables every district officer to issue to every small holder coupons representing his allotted output for the next three months.

The duties are slightly different from the original rates, thus the minimum is to be 2 dollar cents; over 60 per cent to 65 per cent, 14 cents per pound; 65 to 70 per cent, 17½ cents per pound; thereafter an additional 3½ cents on every 5 per cent over 70 per cent to a maximum of 42 cents.

VIEWS ON RESTRICTION

Now that rubber restriction by legislation has finally been introduced, it is not altogether a happy sign that there is no more unanimity among planters than there was before. While many welcome the scheme as saving them from ruin, there is the usual number of "die-hards" who refuse to see anything good in restriction and who prophesy that the result will be disastrous. These do not attach any importance to the sudden rise of the price of the commodity or to the stiffening of the market.

One well-known anti-restrictionist gave it as his opinion that the clamor about overproduction here for the past eighteen months and the constant talk about restriction has resulted in consumers stocking up and now that restriction is in force they will simply hold off until prices reach a level that suits them.

The local press, although by no means unanimous on the value of the scheme, believes that it deserves to be given an honest and fair trial.

The *Straits Times* points out several defects in the scheme, thus: It finds that the Stevenson Committee ignored the condition of the estates and that no steps have been taken to help poor estates over a possible period of reaction from the first boom of restriction. The labor problem, which is of vital importance, has not been considered; no account has been taken of the fact that big stocks have been accumulated by consumers who can therefore resist higher prices if they wish to, with disastrous results to most producers. The scheme restricts exports and leaves production perfectly free so that whoever wishes to do so can continue producing to capacity and hoard the excess product until the restriction ordinances disappear. The scale of maximum output, as given by Mr. Duncan, on which restriction is to be based in cases where the owner is unable to declare the quantity of rubber produced from his holding during the specified period is absolutely incorrect.

The scale is as follows:

Age at January 1, 1920	Maximum output a year per acre
Under 5 years	Nil
Between 5 and 6 years	120 pounds
Between 6 and 7 years	180 pounds
Between 7 and 8 years	240 pounds
8 years and over	320 pounds

In spite of these defects, which could be remedied, the paper in question feels that the scheme ought to be loyally supported. It further considers that the scheme should remain in force until stocks held in Malaya are normal as this would tend to prevent evasion of the law. It also suggests that scare tactics may be used by American consumers for which, it holds, the only reply is more stringent restriction. But to enable producers to carry on, some scheme for financial aid is essential.

The *Malaya Tribune* is glad restriction has come at last and finds that the remarkable part of it is that "the industry probably owes it to 'the enemy'—being the American consumers who take the bulk of the world's rubber. That famous Fifty Millions Scheme may be shown . . . to have clinched the decision of the powers-that-be in London."

The *Malay Mail* hopes it will tend to stabilize prices and do away with ruthless speculation while the *Free Press* sees demand aided to catch up with supply, resulting in the prospect of a shortage of rubber in 1924.

The *Malayan Tin & Rubber Journal* agrees with certain persons that it is curious that America has not expressed an opinion about restriction since it has come into being. But it does not agree that the silence means that Americans are preparing to fight us "tooth and nail." On the other hand, it hopes that the local committees appointed to enforce restriction will pay little heed to the selfish men who will pester them for preferential treatment.

Taking it all in all, people are fairly satisfied that something has at last been done and the rise in prices is considered encouraging, although the more cautious are warning that consumers will probably adopt a wait-and-see attitude which will be reflected in a drop in prices.

Chicle Gum in Malaya

A contributor to the *Malayan Tin & Rubber Journal* points out a neglected potentiality in Malaya, namely the *Achras sapota*, the tree from which chicle gum is obtained in Central America. He quotes an article from THE INDIA RUBBER WORLD, of May 1, 1921, on the history of chicle in the chewing gum business in America. Here in Malaya only the fruit of the *sapodilla*, known here as the *Chiku*, is used and it is suggested that it would be worth while extracting the gum.

Exports of Latex

During September, 1922, rubber latex to the amount of 1,595 gallons, valued at $2,335 (Straits currency), was exported from Malaya. The total shipments of the article up to the end of September, 1922, were 4,678 gallons, valued at $7,626.

Ceylon

Considering the amount of opposition schemes of restriction have encountered, it is surprising to notice how quietly Ceylon is taking the enforcement of restriction. In Malaya, where the Government was constantly asked to intervene, the Stevenson scheme is not as welcome as would be expected and more than one "anti" has voiced his opinion on the subject. But here very little is heard either for or against the scheme. In fact, one might almost say people are indifferent about the matter.

As regards the means of control, a system of licenses will be used here instead of the system of coupons to be used in Malaya. There is also a slight difference in the duty rates which are a trifle lower than in the other colony. Thus the minimum duty will be 2¾ rupee cents per pound (about 1 cent, American currency); over 60 per cent to 70 per cent, 25 cents; 70 to 75 per cent, 37 cents; 75 to 80, 44 cents; 80 to 85 per cent, 50 cents; 85 to 90, 56 cents; 90 to 95, 62 cents; 95 to 100, 69 cents; over 100, 75 cents.

Netherlands East Indies

The news regarding restriction in Malaya and Ceylon was of course received with the necessary excitement. Quite a number of Dutch planters and even some local papers have suggested that the time has come for the Dutch Government to change its attitude regarding restriction. The *Deli* (Sumatra) *Courant* asks whether the Dutch are to continue to keep aloof from any plan of cooperating with the British and reminds its readers that it has said before that the Dutch may yet regret it when later on they will be reproached for having profited by the sacrifices of their British colleags.

The *Nederlandsch-Indisch Rubbertijdschrift*, however, sees no moral obligation on the part of the Dutch to follow the British example. The latter knew the decision of the Dutch Government. Had this not been the case and had the British gone ahead with restriction, half trusting that the Dutch would follow suit, the case would have been different.

The English companies here have not come to any definite decision as to their rôle in the matter of restriction. The directors of Harrisons & Crossfield, Limited, London, will call for 25 per cent restriction on all their estates in Java and Sumatra.

The other companies have not yet received definite instructions from London. However, the production of the British enterprises in Java is so small as compared with the Dutch ones that the effect of restriction on the total production of Java will be very slight.

That many of the Dutch are in favor of restriction is clear from the numerous schemes submitted to local periodicals from time to time. One discussed in an article on crops in Deli, Sumatra, is—let us say—novel. It provides for nothing less than the *extermination* of 50 per cent of the Hevea plantations in all the rubber-planting districts in Asia. After proper investigation by the experiment stations and with their guidance all rubber estates which do not come up to certain standards as regards soil, planting methods, climate, quality and yield of the trees, etc., up to 50 per cent of the total area, shall be destroyed. A selling organization is to be established to control the entire output. All countries joining the scheme are to forbid further planting of new areas. The owners of the rubber to be destroyed are to be compensated from funds laid aside from the price obtained which would undoubtedly immediately go up 40 to 80 cents (gilder cents) per pound.

This plan, says its author, goes to the root of the situation—too much rubber and too much that is inferior, has been planted. All other schemes are like so much patchwork and if the plan outlined is not adopted the price will shortly drop to 20 or even 10 cents a pound.

Forward Contracts

A number of Sumatra companies report forward contracts over 1923.

The Sumatra Rubber Cultuur Mij. Serbadjadi—60,000 kilos at 55 cents per half-kilo and 60,000 kilos at 65 cents per half-kilo.

Lampong Sumatra Rubber Mij.—60,000 kilos at 60 cents per half-kilo and 60,000 kilos, 80 per cent first quality, at 64 cents per half-kilo.

Silau Sumatra Rubber Mij.—60,000 kilos, first quality, at 65 cents per half-kilo.

Rubber Mij. Ambalatoe—60,000 kilos, first quality, at 60 cents per half-kilo.

It is further learned that: the Koloniale Rubber Cultuur Mij. sold 90 tons of rubber at 64½ cents per half-kilo, 75 per cent first quality; the Padang Rubber Mij. sold 60 tons at 62 cents per half-kilo (75 per cent first quality); the Deli-Batavia Rubber Mij. has sold 60 tons at 66 cents per half-kilo.

Sumatra

Rubber Latex

For some time past considerable quantities of latex are being shipped from Belawan-Deli (Sumatra) to the United States. In February, 18,550 kilos were exported; March, 72,600 kilos; May, 65,500 kilos; June, 110,210 kilos; July, 69,364 kilos; August, 56,400 kilos; in all, 392,624 kilos.

Indo-China

Unique in the annals of the history of the rubber planting industry was the occasion on September 13, 1922, when at Saigon, Madame de la Souchère, rubber planter and vice-president of the Syndicat des Planteurs de Caoutchouc de l'Indochine, received the Cross of the Légion d'Honneur.

In 1910, Madame de la Souchère took up rubber planting with her husband in Long-thanh. Shortly afterwards, her husband died, and the young Frenchwoman continued the task of exploiting the concession of more than 1,200 hectares. She won out at last and a model plantation of 700 hectares of Hevea bears testimony to her ability as a planter.

Japan

According to the *Japan Chronicle*, great changes have taken place in the Japanese rubber industry. The rubber factories in Osaka and Kobe have reduced their output to half of that of previous years. Since February many important dealers in rubber have closed their offices or ceased their activities. The Shabamata Shoten stopped their transactions in rubber; the Oyamada Shoten experienced difficulties in carrying out their contracts; the Ueyama Shoten and the Isobo Shoten suffered serious losses on rubber transactions and have closed their offices. The latter firm has filed a petition for bankruptcy.

REPLETE WITH INFORMATION FOR RUBBER MANUFACTURERS—H. C. Pearson's "Crude Rubber and Compounding Ingredients."

Recent Patents Relating to Rubber

The United States

Issued* November 7, 1922

No. 1,434,571 Armored tire. J. Trost, Detroit, Mich.
1,434,576 Heating bag with rubber envelope. L. J. Wertheiner, New York, N. Y.
1,434,577 Tire tube repairing kit. G. B. Dood, Detroit, Mich.
1,434,607 Hair helmet with elastic in edge. J. H. Gilson, Omaha, Neb.
1,434,661 Inner tube. H. Lobel, assignor to A. H. Honey—both of Los Angeles, Calif. (Renewed May 29, 1922.)
1,434,719 Resilient tire. S. R. Murphy, Omaha, Neb., and G. Dumas, Tie Siding, Wyo.
1,434,720 Bead wire and method of making. A. C. Pratt, Deep River, Conn., assignor to International Bead Wire Co., a Delaware Corporation.
1,434,721 Bead wire and method of making. A. C. Pratt, Deep River, Conn., assignor to International Bead Wire Co., a Delaware corporation.
1,434,725 Bottle stopper and method of making. R. Whitaker, Jr., assignor to Manufacturers Iron & Steel Co.—both of New Brunswick, N. J.
1,434,729 Man's garter. W. H. Baer, Portland, assignor to The Russell Manufacturing Co., Middletown—both in Connecticut.
1,434,808 Rubber knee pad. A. A. Burnett and V. L. Darrow, Racine, Wis.
1,434,964 Douche nozzle. J. Rose, Brooklyn, assignor to Dilator Syringe Corporation, New York—both in New York. (Renewed March 22, 1922.)
1,435,088 Elastic handle grip covering. H. W. Smith, assignor of ¼ to E. C. Deibel, both of Akron, and ¼ to G. J. Renner, Youngstown—both in Ohio.

Issued* November 14, 1922

1,435,179 Novelty inflatable tube for advertising. R. Romine, Waldo, W. Va.
1,435,240 Signaling system employing balloon. K. S. Johnson, Jersey City, N. J., assignor to Western Electric Co., Inc., New York, N. Y.
1,435,312 Box for tire valve parts. H. P. Kraft, Ridgewood, N. J.
1,435,432 Inflatable rocking chair tire. S. Toth, Olyphant, Pa.
1,435,446 Self-filling fountain pen. D. W. Beaumel, Brooklyn, N. Y.
1,435,466 Blowout patch. G. S. Hamnett, assignor to The Weld Tire & Rubber Co.—both of Greeley, Colo.
1,435,531 Rubber tire and its attachment to wheels. E. B. Killen, London, Eng.
1,435,558 Fountain attachment for tooth brushes. J. P. Sencindiver, Baltimore, Md.
1,435,566 Pneumatic tire. C. L. Vanderley and C. J. Jorgensen, San Francisco, Calif.
1,435,588 Swimming device. F. J. Cullomer, Chicago, Ill.
1,435,602 Pneumatic arch support. A. T. Hanson, Seattle, Wash.
1,435,667 Vehicle tire shoe. F. A. Schultz, Hasbrouck Heights, N. J.
1,435,718 Resilient tire. V. Lopardo, Springfield, Mass.
1,435,851 Rubberset cushioned handle and insert thimble for implements as hammers, etc. H. S. Isham, Belmar, N. J.

Issued* November 21, 1922

1,436,000 Inflating gage for tires. R. W. Zimmerman, assignor of ⅓ to E. C. Loomis and ⅓ to A. M. Saxe—all of Chicago, Ill.
1,436,028 Sponge rubber playing ball decorated with fabric ornament vulcanized flush with surface. C. F. Flemming, assignor to The Miller Rubber Co.—both of Akron, O.
1,436,082 Dust cap for tire valve. R. P. Byam, Port Gamble, Wash.
1,436,146 Airless tire. C. H. Braden, Los Angeles, Calif.
1,436,235 Bathing cap. W. E. Bush, Fresno, Calif.
1,436,241 Reel for toy balloons. H. H. Davis, Newport, Ky.
1,436,278 Elastic wheel. F. Mathieu, Marseilles, France.
1,436,330 Inflatable device for merchandise display. D. Wiener, New York, N. Y.
1,436,366 Elastic wheel tire. L. Stoll, assignor to the Firm "Sembusto" Elastische Radbereifungen Gesellschaft m. b. H.—both in Vienna, Austria.
1,436,394 Improved patch and process for repairing pneumatic tires. P. E. Hawkinson, Minneapolis, Minn.
1,436,414 Rubber step tread reinforced with metal. F. H. Stanwood, Chicago, Ill., assignor to Stanwood Equipment Co., Boston, Mass.
1,436,500 Collapsible dress form with body of sponge rubber over expansible rings. E. G. Herbert, Brooklyn, N. Y.
1,436,524 Tire valve. A. F. Pesavanto, assignor of ½ to J. B. Gierra—both of Wilkes-Barre, Pa.
1,436,630 Football and other sportball. K. Büchner and Fritz Stöcklein, Schweinfurt, Germany.

*Under Rule No. 167 of the United States Patent Office, the issue closes weekly on Thursday, and the patents of that issue bear date as of the fourth Tuesday thereafter.

Issued* November 28, 1922

1,436,673 Resilient tire. E. G. Niess-Wanter, Pittsburgh, Pa.
1,436,720 Reinforced pneumatic tire. T. Naus, Chicago, Ill.
1,436,782 Pneumatic tire. W. B. Shaw, New York, N. Y.
1,436,793 Cushioned wheel rim. J. H. Clark, Portage City, Wis., assignor of ½ to J. M. Russell, Portland, Oreg.
1,436,930 Rubber heel. S. Adamczyk, Chicopee, Mass.
1,437,013 Grommet or core for tire beads. A. C. Pratt, Deep River, Conn., assignor to International Bead Wire Co., a Delaware corporation.
1,437,065 Rubber heel. J. McGee, Newark, Ohio.
1,437,125 Cord tire. C. L. Archer, Des Moines, Ia.
1,437,154 Pneumatic tire and rim. H. F. Schnell, Irvington, N. J.

The Dominion of Canada

Granted October 24, 1922

224,975 Tire tread. J. Brown, Auckland, New Zealand.
225,078 Resilient heel. A. Trolano, Washington, District of Columbia, U. S. A.
225,094 Fountain pen. A. Winter, Jersey City, N. J., U. S. A.

Granted October 31, 1922

225,271 Airless tire. L. Cartier, Oakland, Calif., U. S. A.
225,289 Resilient cushioned wheel. G. E. Hoard, Washington, District of Columbia, U. S. A.
225,331 Urine container. T. T. Snow, Sioux Falls, South Dakota, U. S. A.
225,349 Heel binder. E. W. Wood, New York City, U. S. A.
225,511 Adjustable pressure valve for tires. L. Gravel, Montreal, and O. Lecuyer, St. Lambert, assignee of ½-interest—both in Quebec.
225,531 Life-saving suit. J. Niemiec, Newark, N. J., and J. Trendel, Hamtramck, Mich., assignee of ½-interest—both in the U. S. A.

Granted November 7, 1922

225,587 Storage battery grid with hard rubber corner. R. S. Hallett, Weymouth, Nova Scotia.
225,652 Battery vent. The Canadian Consolidated Rubber Co., Limited, Montreal, Quebec, assignee of H. Weida, Highland Park, New Jersey, U. S. A.
225,669 Auricular telephone. The Siemens & Halske Aktiengesellschaft, Berlin, assignee of L. Weber, Charlottenburg—both in Germany.
225,670 Telephone transmitter. The Telephone Manufacturing Co. (1920), Limited, London, S. E. 21, assignee of R. L. Murray, Bushey Heath, Hertfordshire—both in England.
225,674 Finger guard for typewriter line spacer. W. V., A. E., and C. E. Redfern, assignee of ⅓ interest, each—all of Victoria, B. C.
225,680 Tire protector. C. Kuentzel and F. T. Lahey, assignee of ½ interest—both of Akron, Ohio, U. S. A.

Granted November 14, 1922

225,841 Closure for rubber garment protectors. M. S. George, St. Louis, Mo., U. S. A.
225,842 Non-inflatable, non-collapsible resilient tire. G. E. Gilmore, Euclid Village, Ohio, U. S. A.
225,887 Pneumatic tire. W. W. Moore, Phillipsburg, Mont., U. S. A.
225,896 Arm apron for haircutters, etc. E. C. Pease, Nantucket, Mass., U. S. A.
225,991 Elastic wheel with rubber disks around hub. C. L. Renard and H. J. M. Peny, assignee of ½ of the interest—both of Eaubonne, Seine and Oise, France.
226,068 Parachute. S. Szucs, Homestead, Pa., U. S. A.
226,069 Valve device for inflatable garments. J. J. Tischer, Westbury, Long Island, New York, U. S. A.

The United Kingdom

Published November 1, 1922

185,521 Breast pump. M. R. Del Castillo, 13 Buen Pastor street, San Sebastian, Spain.
185,630 Sponge rubber sock with sponge rubber foot arch support. W. Callan, 1 Greyhound Terrace, Greyhound Lane, Streatham, London.
185,758 Spring vehicle wheel with rubber cushioning ring. J. de Cosmo, 86 bis rue de Villiers, Larallois Perret, Seine, France. (Not yet accepted.)
185,764 Rubber tile. J. H. Hale, 33 Cotham Road, Bristol.

Published November 8, 1922

185,799 Inner tire molded in two parts, then vulcanized together, etc. G. A. H. Robbins, Delamore, Kedron, and S. F. E., Einsiedel, 82 Arthur street, New Farm—both in Brisbane, Australia.

Chemical Patents will be found on 225-226; Machinery and Process Patents on pages 229-230

185,901 Inking roller with rubber innerpart. G. Runge, 1374 East 12th street, Cleveland, Ohio, U. S. A.

185,908 Tire valve. R. G. Old, 37 Limes Road, and F. W. Hill, 138 Dover Road—both in Folkestone, Kent.

185,919 Bathing appliances with inflatable rubber bladders. C. Keith, 2 Cecil Road, Wimbledon, London.

185,932 Pneumatic tire. I. Cuppitman, 16 Barbican, London.

185,943 Brush with bristles amalgamated with rubber. C. A. Don, 47 Norfolk Road, Brighton, Sussex.

185,988 Inner tire molded in two parts, then vulcanized together. G. A. H. Robbins, Delamore, Kedron, and S. F. E. Einsiedel, 82 Arthur street, New Farm—both in Brisbane, Australia. (Refers to Specification No. 185,799.)

186,005 Bougies, catheters, etc., with tapered helices. L. M. C. Charnaux, 26 avenue Victoria, Vichy, France.

186,053 Cushion wheel. L. Carlberger, 49 Turnerg, Mödling, Vienna. (Not yet accepted.)

Published November 15, 1922

186,278 Improved construction of flanged rubber studs for boots. G. Newman, Syria Castle street, East Cowes, Isle-of-Wight.

186,328 Metal dust cap for tire valves. A. Schrader's Son, Inc., 470 Vanderbilt avenue, Brooklyn, N. Y., assignee of H. P. Kraft, 219 Godwin avenue, Ridgewood, N. J.—both in U. S. A. (Not yet accepted.)

186,334 Reservoir pen. O. Mitchell, 1561 Beacon street, Brookline, Mass., U. S. A. (Not yet accepted.)

186,349 Shielded electric conductors. Western Electric Co., Limited, Norfolk House, Victoria Embankment, Westminster; assignee of H. Glenn, 108 Park street, Westfield, New Jersey, U. S. A. (Not yet accepted.)

Published November 22, 1922

186,368 Inflatable pontoons for raising sunken ships. J. W. Reno, 261 Broadway, New York, N. Y., U. S. A.

186,390 Temporary tire valve cap. A. Schrader's Son, Inc., 783 Atlantic avenue, Brooklyn, New York, U. S. A., and J. T. Dyer, 81 Alberta Road, Bush Hill Park, Enfield, Middlesex.

186,460 Parachute. C. Broadwick, 1701 Oak street, San Francisco, Calif., U. S. A.

186,516 Pneumatic tire. H. S. Rector, 1801 South Michigan avenue, Chicago, Ill., U. S. A.

186,546 Reservoir pen. E. Hitchon, The Brae, Kendal, Westmoreland.

186,573 Garter. L. Platt, 210 Cathedral Parkway, New York City, U. S. A. (Not yet accepted.)

Published November 29, 1922

186,643 Detachable studs of rubber or leather for soles and heels of cricket and other boots and shoes. E. A. Plant, 1 Station street, Porth, Glamorgan.

186,818 Reservoir pen. L. Badois, 212 Boulevard Pereire, Paris.

186,828 Golf practicing appliance. H. W. Smith, 687 Aberdeen street, Akron, Ohio, U. S. A.

186,864 Rubber paving. H. W. Badger, 16 Coney street, York; A. W. W. Norfolk, Glen Devon Estate, Halgranoya, Ceylon.

186,880 Tire tread band. H. H. Swan, 1213 Sherman street, Grand Rapids, Mich., U. S. A.

New Zealand

Published October 5, 1922

46,819 Resilient tire filled with inflated balls. T. H. Channon, 43 Booth street, Balmain, Sydney, N. S. W.

47,326 Inner reinforced with self-healing mastic. E. W. Thurlow, 28 Normanby street, Middle Brighton and W. K. Hughes, 22 Collins street, Melbourne—both in Victoria.

47,741 Milking machine teat cup mouthpiece. J. H. Mason, Te Marapai Reid's Line, Feilding.

48,148 Apparatus for obtaining film record of sound vibrations through the agency of light and reproducing sound from a photographically printed film sound record provided with rubber diaphragm. A. J. Garrod, 99 Sussex street, Sydney, N. S. Q.

Published November 2, 1922

46,377 Pneumatic warning horn bulb. J. F. Smith, 31 Speedwell Road, Edgbaston, Birmingham, Eng.

Germany

Patents Issued, with Dates of Issue

362,287 (March 1, 1922) Sanitary band. Richard Kossack, Steinstrasse 56, Dessau.

362,288 (July 1, 1920) Pessary. Georgina Jane Wallace, London; represented by Dr. R. Geissler, Berlin, S. W. 11.

362,338 (March 27, 1920) Resilient wheel. Soc. An. Brevetti Ruit, Turin, Italy; represented by H. Springmann, E. Herse and F. Sparkuhle, Berlin, S. W. 61.

362,556 (March 3, 1921) Syringe for medicaments. Deutsch-Englische Quartzschmelze, G. m. b. H., and Dr. Zacharias von Hirschberg, Berlin-Pankow.

362,557 (September 29, 1920) Syringe for medicaments. Georg Hasse, Andreasstrasse 21, Berlin.

362,558 (July 17, 1921) Aladar Förstner, Budapest; represented by Glowacki, Berlin, S. W. 61.

362,774 (July 31, 1921) Vaginal syringe. Emil Spardel, Pappeallee 3, Hamburg.

365,504 (June 4, 1919) Resilient tire. Hjalmar Möller, Vedbak, and Jorgen Madsen Grene, Silkeborg, Denmark; represented by E. Hoffmann, Berlin, S. W. 68.

365,709 (September 1, 1921) Hypodermic syringe. Frank Lafayette Platt, George Nicholas Hein and Robert Russel Impey, San Francisco, California, U. S. A.; represented by Caminer, Berlin, W. 62.

365,913 (November 21, 1920) Syringe. Dr. Apostol Waswasof, Küstrinerstrasse 26, Berlin.

367,017 (May 31, 1922) Rubber disk wheel. Georges Broulhiet, Le Rond-Soint, St. Etienne, Loire, France; represented by F. Meffert and Dr. Sell, Berlin, S. W. 68.

367,068 (September 18, 1920) Turn sole of molded and vulcanized rubber. United Shoe Machinery Corporation, Paterson, N. J., and Boston, Mass., U. S. A.; represented by K. Hallbauer and A. Bohr, Berlin, S. W. 61.

367,187 (March 22, 1921) Rubber ring closing especially for large vessels with high internal pressure. Albert Scholz, Koesfeld, Westphalia.

Design Patents Issued, with Dates of Issue

825,996 (December 13, 1920) Medicinal inhaling apparatus with mantle heating. Paul Maletz, Bad Reichenhall.

826,205 (June 15, 1922) Powder spray for the nose. Pfeiffer & Sohn, Jena.

826,222 (August 14, 1922) Rubber suction closing valve. Edwin Max Reichart, Delitzscherstrasse 160, Leipzig-Eutritzsch.

826,235 (August 31, 1922) Electrically heated irrigator. Adolf Weissenburger, Isenburgring 4, Offenbach-on-the-Main.

826,313 (July 4, 1922) Bicycle tire valve (Sclaverand System), with rubber closing. Theodor Kicker, Roennebergstrasse 3, Berlin-Friedenau.

826,327 (August 24, 1922) Rupture band with extra movable pelotte. Firma R. Blume, Charlottenburg.

829,625 (January 2, 1922) Sanitary binder. Max Manfred v. d. Heyden, Leipzigerstrasse 119-120, Berlin.

829,628 (June 30, 1922) Holder for sanitary binder. Radium Gummiwerke m. b. H., Köln-Dellbrück.

830,358 (September 30, 1922) Rubber scraper. Paul Zippel, Bunzlau.

830,437 (October 18, 1922) Sole protector of rubber. Heinrich Charmann, Birkenstrasse 71, Düsseldorf.

830,472 (October 9, 1922) Nail catcher for tires. Max John, Eibenstackerstrasse 17, Dresden.

830,603 (September 2, 1922) Rubber soling. Paula Meta Albrecht, Sedanplatz 4, Dresden.

830,697 (September 2, 1922) Self-acting irrigator. Franz Paul Smietana, Wurzen.

830,698 (September 25, 1922) Self-acting irrigator. Franz Paul Smietana, Wurzen.

830,853 (June 24, 1922) Rubber sole. Heinrich Dresnig, Hansastrasse 12, Dortmund.

830,870 (October 20, 1922) Pessary. Dr. Heinrich Fischer, Karlsbad; represented by O. Sack, Leipzig.

830,871 (October 20, 1922) Cone pessary. Dr. Heinrich Fischer, Karlsbad; represented by O. Sack, Leipzig.

830,872 (October 20, 1922) Pessary. Dr. Heinrich Fischer, Karlsbad; represented by O. Sack, Liepzig.

830,873 (October 20, 1922) Pessary. Dr. Heinrich Fischer, Karlsbad; represented by O. Sack, Leipzig.

830,874 (October 20, 1922) Ring pessary. Dr. Heinrich Fischer, Karlsbad; represented by O. Sack, Leipzig.

830,883 (October 23, 1922) Rubber sole. Mitteldeutsche Gummiwarenfabrik Louis Peter A.-G., Frankfurt-on-the-Main.

830,888 (October 25, 1922) Rubber tire without air. Willy Klötzer, Markusstrasse 15, Dresden.

Trade Marks

The United States

Two Kinds of Trade Marks Now Being Registered

Under the rules of the United States Patent Office, trade marks registered under the Act of February 20, 1905, are, in general, fanciful and arbitrary marks, while those registered under the Act of March 19, 1920, Section 1 (b), are non-technical, that is, marks consisting of descriptive or geographical matter or mere surnames. To be registered under the latter act, trade marks must have been used for not less than one year. Marks registered under this act are being published for the first time when registered, any opposition taking the form of an application for cancellation.

Granted November 7, 1922, Act of February 20, 1905

161,041 THE LADY and representation of a miniature of a lady—corsets, brassieres, etc. American Lady Corset Co., Detroit, Mich.

161,050 AUD LIFE SAVING SUIT, THE AUD COMPANY INC. between two concentric circles, the inner one enclosing representation of a man floating upright, reading a newspaper, and the words, TRADE MARK REGISTERED—life saving suits. The Aud Co., Inc., Herndon, Va.

161,104 PATSY SANDAL within a double oval outline—women's and children's shoes of leather, rubber, or fabric, combined. Craddock Terry Co., Lynchburg, Va.

161,110 SOXON—hose supporters. W. L. Deming, doing business as Standard Specialty Co., Salem, O.

161,168 Representation of a hand grasping a rod, silhouetted against a black disk—rubber heels. Holtite Manufacturing Co., Baltimore, Md.

161,189 SPIFFY JIFFY—infants' pants. I. B. Kleinert Rubber Co., New York, N. Y.

161,190 SPIFFY—infants' pants. I. B. Kleinert Rubber Co., New York N. Y.

161,197 "A to Z" COMFORT—shoes of leather and rubber combined. Lane Brothers Co., Boston, Mass.

161,218 IDEAL—rubber heels. Lynch Heel Co., Chelsea, Mass.

161,202 FLEXATOR within double outlined rectangle having the corners cut off obliquely—boots, shoes and slippers of leather, rubber, etc. Thomas G. Plant Co., Boston, Mass.

161,272 BUCKING THE LINE and representation of a football—E. E. Rees, Chicago, Ill.

161,275 PEDICLINIC divided by conventionalized representation of a foot on which the first C is centered—shoes and slippers of leather, rubber, fabric, and combinations. V. Richter, Washington, D. C.

161,291 Conventionalized representation of a padlock—belting composed of fabric and rubber. Security Rubber & Belting Co., Chicago, Ill.

161,306 LONGRIP—garters. Star Suspender Co., Philadelphia, Pa.

161,307 Representation of a picture frame and a portion of a garter—garters. Star Suspender Co., Philadelphia, Pa.

161,308 HICKORY—aprons, girdle supporters, and infants' pants. A. Stein & Co., Chicago, Ill.

161,318 Representation of a label divided into two parts, one bearing the words, THE TIMBRO STANDARDIZED SHOE, and the other, "EACH PART THE STANDARD OF ITS CLASS"—shoes made of leather, rubber, and fabric. Timson Bros., Inc., Boston, Mass.

Act of March 19, 1920, Section 1 (b)

161,362 DRI-CLAD—rubber-surface clothing. Franklin Rubber Co., Boston, Mass.

161,371 KANT RIP—garters. A. M. Malouf, New York, N. Y.

161,381 WEAREVER—sanitary aprons and belts. J. Stein, New York, N. Y.

161,382 Representation of a portion of the human body wearing an abdominal supporter—binder and abdominal supporters. K. L. Storm, Philadelphia, Pa.

161,385 WEARWELL NOSE BETTER—shoes of leather and rubber combined. Wearwell Shoe Co., Inc., New York, N. Y.

Granted November 14, 1922, Act of February 20, 1905

161,404 BETTY BATES within an oval representing couched strands—rubber and leather boots and shoes, rubber boots, etc. A. J. Bates & Co., Inc., New York, N. Y.

161,430 VULCANETTE—raincoats. Cambridge Rubber Co., Cambridge, Mass.

161,455 MUMSLEEP—antisnoring device. D. H. Miller, doing business as the Mumsleep Co., Sacramento, Calif.

161,478 C-G—leather, rubber, composition, etc., trusses, abdominal supporters, jock straps, etc. L. D. Gandion, doing business as Clark-Gandion Truss Co., San Francisco, Calif.

161,490 GOVERNOR—belts, belting and elastics used in wearing apparel, garters, etc. The Governor Fastener Co., New York, N. Y.

161,561 "CRADLE TO COLLEGE"—shoes made of leather, rubber, fabric, and combinations. H. W. Merriam Shoe Co., Newton, N. J.

161,608 HIGHLAND HEATHER—raincoats. Rosenwald & Weil, Inc., Chicago, Ill.

161,609 B. W. BUSINESS WOMAN in white letters on black octagonal background surrounded with stenciled border, above the words COMBINATION LAST in black letters—women's boots and shoes made of leather, fabric, rubber, or combinations. The Roth Shoe Manufacturing Co., Cincinnati, O.

161,673 BORO EUCOL—nasal douche. W. W. Winberg, trading as The Winberg Druggists' Supply Co., Wilmette, Ill.

161,674 PALCO—fountain syringes with or without metal hot-water bottles. Worcester Pressed Aluminum Co., Worcester, Mass.

Act of March 19, 1920, Section 1 (b)

161,685 RAND—waterproof infants' pants and bibs, and bathing caps. Brooklyn Shield & Rubber Co., Brooklyn, N. Y.

161,697 HARLEY-DAVIDSON—tire talc. Harley-Davidson Motor Co., Milwaukee, Wis.

161,717 METERED MAIL on oval background—postmarking, stamping, and counting machines using rubber belts, wheels, etc. Pitney-Bowes Postage Meter Co., Stamford, Conn.

161,728 PEERLESS—radio apparatus, head sets, etc. Thompson-Levering Co., Inc., Philadelphia, Pa.

The Dominion of Canada

Registered

32,130 FAIRY KISS—toilet articles including powder puffs. The Kelton Rubber Co., Toronto, Ont.

32,132 CARBILAK—resinous material of phenolic or other origin and products made from it. Canadian Electro Products Co., Ltd., Montreal, Que.

32,133 INSULAK—resinous material of phenolic or other origin and products made from it. Canadian Electro Products Co., Ltd., Montreal, Que.

32,186 ECONO-MIST CARBURETERS—auto accessories, including gaskets, mats, brake linings, tire gages, etc. T. M. Finney, Montreal, Que.

32,197 EVEREDY with representation of an athlete stretching a patch in an oval surrounded by rays—tire tube patches. F. H. Binninger, trading as Dandee Patch Manufacturing Co., Cleveland, Ohio, U. S. A.

32,198 DANDEE with representation of two athletes stretching a patch—tire tube patches. F. H. Binninger, trading as Dandee Patch Manufacturing Co., Cleveland, Ohio, U. S. A.

32,237 DON'T TELL YOUR AGE—corsets, brassières, girdles, hose supporters, etc. American Lady Corset Co., Detroit, Mich, U. S. A.

32,245 BONE DRY—waterproof garments. Gault Brothers, Ltd., Vancouver, B. C.

32,255 PARKER—fountain pens. The Parker Pen Co., Janesville, Wis.

The United Kingdom

Published November 1, 1922

421,653 TRISTAR within geometric figure formed by two triangles, and three six-pointed stars—asbestos packing joints. Société Anonyme des Metaux Tristar, 17 Boulevard Helvétique, Geneva, Switzerland; address in United Kingdom, care of A. L. Mond, 19 Southampton Buildings, Chancery Lane, London, W. C. 2.

426,315 PARAPED—natural unvulcanized crêpe india rubber sheet. R. F. Browne & Co., 158 Leadenhall street, London, E. C. 3.

428,017 SELCONCUSCO within a rectangle superimposed above the letters S C A C O—all goods included in Class No. 40. The Self Controlled Air Cushion Co., Ltd., Scaco Works, Clifton street, Newton Heath, Manchester.

428,210 M., L. & B. arranged within geometric figure on representation of a seal—all goods included in Class No. 40. Farbwerke formerly Meister Lucius & Brüning, Hoechst-on-the-Main, Germany; address in United Kingdom, care of Abel & Imray, 30 Southampton Buildings, London, W. C. 2.

428,586 CAPITOL—rubber tires. Holday Brothers, Ltd., 23-27 Great Eastern street, London, E. C. 2.

428,757 BLUE PENNANT—rubber and gutta percha goods not included in classes other than Class No. 40. Industrial Rubber Products, Ltd., Brook House, 191-192 Tottenham Court Road, London, W. 1.

428,759 FEDERAL—rubber and gutta percha goods not included in classes other than Class No. 40. Industrial Rubber Products, Ltd., Brook House, 191-192 Tottenham Court Road, London, W. 1.

428,981 RELLIM—rubber and gutta percha goods not included in classes other than Class No. 40. Industrial Rubber Products, Ltd., Brook House, 191-192 Tottenham Court Road, London, W. 1.

Published November 8, 1922

419,719 CAPASCO—packings, brake linings, etc. The Cape Asbestos Co., Ltd., Guildhall Annexe, 23 King street, London, E. C. 2.

419,720 CAPETTO—packings, brake linings, etc. The Cape Asbestos Co., Ltd., Guildhall Annexe, 23 King street, London, E. C. 2.

423,423 SWAN—dolls and various kinds of toys included in Class No. 50. John G. Murdoch & Co., Ltd., proprietors of Star Manufacturing Co., Hatton House, Hatton Garden, London, E. C. 1, and 29 High street, New Oxford street, London, W. C. 2.

425,074 ATLAS—footballs, tennis balls, etc. O. E. Lewis, 50 Stanley Road, Woodford, London, E. 18.

425,671 FIVESTENN—games and sporting articles not included in classes other than Class No. 49.

426,758 WITCH—all goods except golf balls included in Class No. 49. D. Mason & Sons, Ltd., 12-18 Bath Row, Birmingham.

426,898 IMPERIO—all goods included in Class No. 49. W. G. Morris, trading as The Morris Golf Ball Manufacturing Co., 17 Queens Road, Merton, London, S. W. 19.

426,887 ROYLAND—all goods included in Class No. 49. W. G. Morris, Golf Ball Manufacturing Co., 92 Gardield Road, Wimbledon, London.

428,946 LENCI—toys and dolls. E. Scavini, 5 via Marco Polo, Turin, Italy; address in United Kingdom, care of Lloyd Wise & Co., 10 New Court, Lincoln's Inn, London, W. C. 2.

Published November 15, 1922

425,518 B & D in center of representation of a six-sided seal bearing the manufacturer's name and address—portable electric machines, grinders, air compressors, etc. The Black & Decker Manufacturing Co., 600 East Pennsylvania avenue, Towson Heights, Baltimore, Md., U. S. A.; address in United Kingdom, care of McKenna & Co., 31-34 Basinghall street, London, E. C. 2.

B426,326 "RESISTORM"—leather clothing and rubber-lined clothing for motorists, aviators, etc. H. Doffman, Doffman's Corner, 1 Abington street, and 22 Market Square, Northampton.

B428,776 NOBBY—tires. United States Rubber Co., Ltd., 47 Farringdon street, London, E. C. 4.

429,091 ULTRA—waterproof and rainproof coats. J. Lipsitz, 15 Piccadilly, Manchester.

429,383 HENLEX—electric cables. W. T. Henley's Telegraph Works Co., Ltd., 13-14 Blomfield street, London Wall, London, E. C. 2.

Published November 22, 1922

425,142 TAB-TEN—table lawn tennis game, etc. D. H. E. King, 13 Paternoster Row, London, E. C. 4.

427,209 FLAMINAX—fire hose, etc. Minimax Gesellschaft mit Beschränkter Haftung, Unter den Linden 2, Berlin, W. 8, Germany; address in United Kingdom, care of Boult, Wade & Tennant, 112 Hatton Garden, London, E. C. 1.

427,468 GOODRICH TYRES "SMILE AT MILES" above representation of a tire bearing the words "SUPER CORD," in turn above representation of a touring car on road just outside of a country village; all on representation of a poster or label—tires. The B. F. Goodrich Co., Ltd., 117-123 Golden Lane, London, E. C. 1.

427,496 CHEVRON—packings and jointings included in Class No. 50. James Walker & Co., Ltd., Lion Works, Garford street, Poplar, London, E. 14.

427,975 HONDURITE—goods of rubber or in which rubber predominates, except tires, included in Class No. 40. Russells (Manchester), Ltd., Land's End Works, Rhodes, Manchester.

428,758 DEFENDER—goods of rubber and balata not included in classes other than Class No. 40, except machine belting in which balata predominates. Industrial Rubber Products, Ltd., Brook House, 191-192 Tottenham Court Road, London, W. 1.

429,039 CHROMATA—balata goods or goods in which balata predominates, not included in classes other than Class No. 40. John Tullis & Son, Ltd., St. Ann's Works, 86 John street, Bridgeton, Glasgow.

429,437 RAYURE—rubber balls, toys, and other articles for sports and games. Birsco, Ltd., 27 Bridge street, Southampton.

429,774 PRESTO—games and sporting goods not included in classes other than Class No. 49, except golf balls. H. Templer, trading as The Templer Sports Co., 301A, Kingston Road, Merton Park, London, S. W. 20.

New Zealand

Published September 7, 1922

18,516 P-K[s] and conventionalized Brownie-type figure between two arrows—chewing gum. Wm. Wrigley, Jr., Co., 400 North Michigan avenue, Chicago, Ill., U. S. A.

18,517 P-K[s] on representation of a piece of candy-coated chewing gum and two arrows—chewing gum. Wm. Wrigley, Jr., Co., 400 North Michigan avenue, Chicago, Ill., U. S. A.

19,187 TEXTILEATHER and the word COMPANY in white letters on the tail of the final R extended backward under the first word—imitation leather and leather substitutes. Textileather Co., 1819 Broadway, New York City, U. S. A.

Designs

The United States

Issued* November 7, 1922

61,637 Tire. Term 3½ years. M. Aaron, Cincinnati, O.

Issued* November 14, 1922

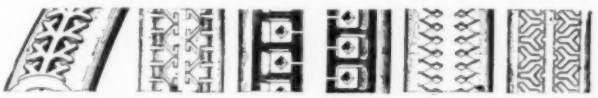
61,665 Tire casing. Term 14 years. R. M. Pierson, Akron, O., assignor to The B. F. Goodrich Co., New York, N. Y.

61,671 Tire tread. Term 3½ years. W. I. Thompson, Indianapolis, Ind.

Issued* November 21, 1922

61,674 Tire. Term 14 years. E. O. Fritch, Belmont, assignor to Hood Rubber Co., Watertown—both in Mass.

61,690 Tire. Term 3½ years. H. G. Schmidt, assignor to The Norwalk Tire & Rubber Co.—both of Norwalk, Conn.



61,637 61,674 61,671 61,665 61,690

*Under Rule No. 167 of the United States Patent Office, the issue closes weekly on Thursday, and the patents of that issue bear date as of the fourth Tuesday thereafter.

The Dominion of Canada

Registered

5,591 Sole of rubber boot or shoe. Canadian Consolidated Rubber Co., Ltd., Montreal, Que.

5,592 Tire tread. Canadian Consolidated Rubber Co., Ltd., Montreal, Que.

5,600 Golf ball with surface depressions forming lattice pattern. Dunlop Tire and Rubber Goods Co., Ltd., Toronto, Ont.

5,609 Tire tread, consisting essentially of a continuous central rib extending around periphery and intersected by other tread members similar in shape to the numeral 7. Gutta Percha & Rubber, Limited, Toronto, Ont.

Interesting Letters from Our Readers

From a Prominent Paper Manufacturer

TO THE EDITOR:

DEAR SIR: I am reading with much interest your articles and circulars in regard to rubber in paper, and am passing them over to others to read. We have already subscribed to THE INDIA RUBBER WORLD and will keep it before us with the latest news on rubber in paper.

We got hold of a few gallons of rubber latex recently and our laboratory made four tests; ink test, tearing test, bursting test and folding test. Comparing the figures with those of Mr. Kaye they seem to bear out his claims. The cost of the latex, which we obtained from the Department of Commerce, was $1.45 per gallon, but we since learned that a New York importer has received some on the dock at 95 cents per gallon.

The conclusion that our laboratory reached was that rubber latex in our type of paper would not benefit it enough to justify the increased cost of manufacture, even at the above lowest price.

If you should happen to get hold of any larger samples of paper where rubber is used I shall be pleased to see them and will pass them along.

Boston, Massachusetts. PAPER MANUFACTURER.

Inflation and Grip of Pneumatic Tires

TO THE EDITOR:

DEAR SIR: We refer to the second paragraph of your editorial, "Rubber Antiskids for Safety," in the November issue of THE INDIA RUBBER WORLD.

The conclusion that a well-inflated pneumatic tire will skid less than one of lower inflation does not agree with practical experience nor with laws of friction. An under-inflated tire may roll on a turn more than a fully inflated tire, but it will skid less.

It is a fairly well-known fact that in sandy or muddy going a tire of low inflation pressure will pull a car out of difficulty where a highly inflated tire would not give sufficient traction. This is true to a lesser degree on hard surface roads. Increased traction is possible by the greater width of the tire and its greater flexibility which allows the tire surface to conform more nearly to the unevenness of the road, thereby getting better grip.

From the standpoint of laws of friction, the deduction is wrong that "other things being equal, the more road contact there is the more is the tendency to side slip because the less will be the specific pressure upon the road at any point."

It is true that frictional resistance per unit area varies directly as the pressure per unit area. But the unit area of contact between a tire of low inflation and one of higher inflation is not the same; lower inflation produces correspondingly greater contact area of tire with road. Therefore, while the load remains the same the contact area is increased by lower inflation.

Theoretically other conditions being the same, the total contact friction between a low and high inflated tire is the same on an absolutely smooth road surface. Practically on average roads the low inflated tire has more grip due to the reasons stated in second paragraph above.

B. J. LEMON,

Technical Service Department, United States Tire Co.

New York, N. Y.

Rubber Paving for Boston

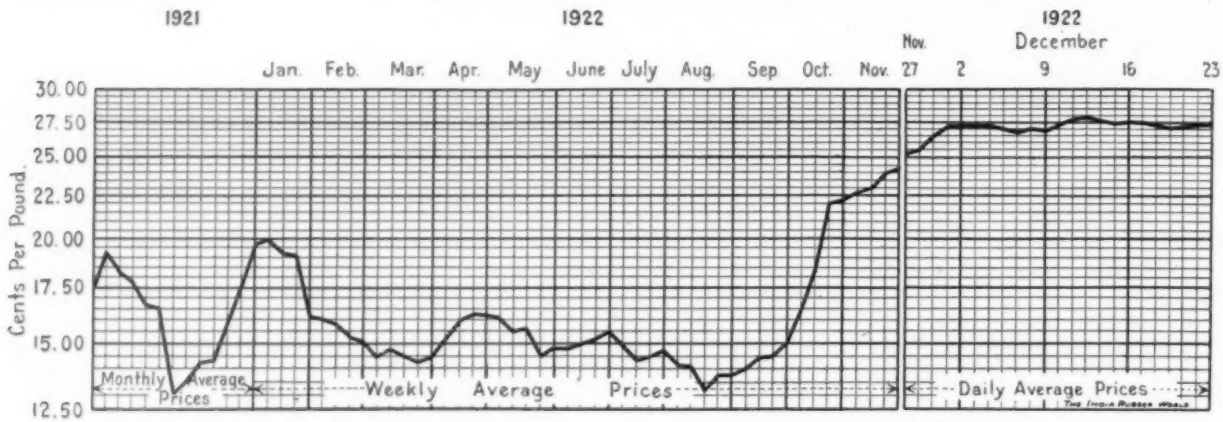
TO THE EDITOR:

DEAR SIR: His Honor, Mayor James M. Curley of Boston, has asked me to obtain for him information in connection with rubber pavements.

If any of the large rubber companies would be interested in this matter, I would be pleased to have them address me on the subject as it is quite possible that I may be able to induce the mayor of our city to lay rubber pavements around some of our prominent hospitals.

With the low price of crude rubber and the large amount of reclaim existing, it would seem that the time for the manufacture of rubber pavements is near at hand and that some progressive manufacturer will be able to put rubber covered paving blocks on the market and develop a very large business.

126 Massachusetts Avenue, DAY BAKER.
Boston 17, Massachusetts.



Ratio Graph of New York Market Fluctuations—Average Prices of Ribbed Smoked Sheets

Review of the Crude Rubber Market

New York

THE advance in price of ribbed smoked sheets which has characterized the market since the middle of last August, still continues. On December 23 the price reached 27¼ cents, the highest it has been since August, 1920.

Early in the last week of November the price rose sharply to 27 cents and the market developed decided increase of buying interest and active trading with stocks in strong hands. Factories were buying, however, only for current needs.

The feature of the first week of December was a slight reaction, although the average price for the week was maintained at 27 cents. The market was steady and quiet with a small amount of factory buying and some scattered trading in futures.

Early in the second week prices were higher and a more active condition of the market prevailed. Fair buying interest developed, followed by dull trade as sterling exchange receded. The average price for ribs was 27½ cents as compared with 27 cents the week preceding. Later in this week trade became somewhat speculative and buyers' and sellers' ideas were far apart. The factories were holding back for concessions on the part of dealers and they in turn were looking for a drop in the eastern markets.

The week before Christmas, trade continued speculative with little change in prices. There was a moderate price advance about the middle of the week which was not sustained, the New York price failing to meet this London advance.

Average price for the week was 27¼ cents.

The market for the last week of the year opened with spot ribs at 27¼ cents. There was practically no activity on the part of either buyers or sellers, with this condition liable to hold till the turn of the year.

Importations of all grades during November were 23,258 tons compared with 19,738 tons one year ago. Plantation arrivals for November were 21,788 tons compared with 18,631 tons for November one year ago. Total importations of all grades for eleven months ended November 30 were 252,858 tons as compared with 162,673 tons for the corresponding period last year.

Spot and future quotations on standard plantation and Brazilian grades were as follows:

PLANTATIONS. December 1. Spot first latex crêpe, 27½ cents; Dec., 27¼ cents; Jan.-Mar., 28 cents; Apr.-June, 28¾ cents. DECEMBER 26. Spot first latex crêpe, 27¼ cents; Jan., 27⅛ cents; Jan.-Mar., 27¼ cents; Apr.-June, 28⅛ cents; July-Sept., 28½ cents.

DECEMBER 1. Spot ribbed smoked sheets, 27¼ cents; Dec., 27¼ cents; Jan.-Mar., 28 cents; Apr.-June, 28¾ cents. DECEMBER 26. Spot ribbed smoked sheets, 27¼ cents; Jan., 27⅛ cents; Jan.-Mar., 27⅛ cents; Apr.-June, 28⅛ cents; July-Sept., 28½ cents.

DECEMBER 1. Spot, No. 1 amber crêpe, 26¾ cents; Dec., 26¾ cents; Jan.-Mar., 27½ cents. DECEMBER 26. Spot No. 1 amber crêpe, 26½ cents; Jan., 26¾ cents; Jan.-Mar., 27 cents.

DECEMBER 1. Spot No. 1 rolled brown crêpe, 25½ cents; Dec., 25⅝ cents; Jan.-Mar., 25¾ cents. DECEMBER 26. Spot No. 1 rolled brown crêpe, 25¼ cents; Jan., 25½ cents; Jan.-Mar., 25⅝ cents.

SOUTH AMERICAN PARÁS AND CAUCHO. DECEMBER 1, Spot, upriver fine, 25 cents; islands fine, 22¼ cents; upriver coarse, 18½ cents; islands coarse, 13½ cents; Cametá, 14½ cents; caucho ball, 19¼ cents. DECEMBER 26. Spot, upriver fine, 24½ cents; islands fine, 21½ cents; upriver coarse, 18½ cents; islands coarse, 14½ cents; Cametá, 14 cents; caucho ball, 20-21 cents.

London

The sharp rise in ribbed smoked sheets, which characterized the market during the first ten days of the month, was followed by a slight decline on receipt of heavy arrivals. The price was well sustained at 13⅞*d.* for the next three weeks, when there was an advance to 14*d.*, to which the New York market did not respond.

It is expected that London arrivals will increase in the near future because of the recent activity of consumers.

New York Quotations

Following are the New York spot quotations per pound, for one year, one month ago, and December 26, the current date:

Plantation Hevea	December 1, 1921	December 1, 1922	December 26, 1922
CREPE			
First latex	$0.20 @	$0.24½@.24¾	$0.27¼@
Off latex	.19 @	.23¾@	.26½@
Amber No. 1	.19 @	.24 @	.26½@
Amber No. 2	.18½@	.23¾@	.26 @
Amber No. 3	.18 @	.23½@	.25½@
Brown, thick, thin, clean	.18½@	.23½@	.26½@
Brown, specky	.17½@	.22¾@	.25½@
Brown, rolled	.16½@	.22½@	.25¼@

Crude Rubber Market—*Continued*

Plantation Hevea—*Continued*

	December 1, 1921	December 1, 1922	December 26, 1922
SHEET			
Smoked, ribbed	$0.20 @	$0.24½@.24¾	$0.27¼@
Smoked, plain	.19 @	.23 @	.25 @
Unsmoked	.18½@	.22¾@	.24½@
LIQUID LATEX			
Liquid latex	@	*per gal.* 1.25	*per gal.* 1.25
SCRAP			
Colombo scrap No. 1	†.16½@	.17½@.18	.22 @
Colombo scrap No. 2	†.14¾@	.16 @.17	.20 @.21

East Indian

PONTIANAK			
Banjermassin	.08¾@	.08 @	.08½@
Pressed block	.11¾@	.13 @.15	.13 @.15
Sarawak	.06½@	.06⅝@.06¾	.07¾@

South American

PARAS			
Upriver fine	.24 @	.24 @	.24½@
Upriver fine*	@	*.32½@	*.33 @
Upriver medium	.21½@	.21 @	.22½@
Upriver coarse	@	.17 @	.18½@
Upriver, weak, fine	.20 @	@	@
Islands fine	.20½@	.22 @	.21½@
Islands fine*	@	*.30½@	*.31 @
Islands medium	.18½@	.19¾@	.19¾@
Islands coarse	.10½@	.12½@	.14½@
Cametá	.09½@.10½	.12 @	.14¼@
Cametá*	@	*.26 @	*.27½@
Acre Bolivian fine	.24 @.24½	.24½@	.25 @.25¼
Acre Bolivian fine*	@	*.32½@	*.33 @
Beni Bolivian	.24 @.24½	.24½@	.25¼@
Madeira fine	.25 @.25½	.26 @	.26¾@
Peruvian fine	.22½@.23½	.22½@	.24 @
Tapajos fine	.21½@.22½	.22½@	.22½@.23
CAUCHO			
Upper caucho ball	.14 @	.18 @	.21½@
Upper caucho ball*	@	*.27 @	*.27 @
Lower caucho ball	.11½@.12½	.17¼@	.20 @

Manicobas

Ceará negro heads	†.12 @	†.20 @	†.20 @
Ceará scrap	†.08 @	†.18 @	†.18 @
Manicoba 30%, guaranty	.09 @	†.15 @	†.15 @
Mangabeira, thin sheet	.15 @	†.20 @	†.20 @

Centrals

Central scrap	.13½@.14½	.15 @.17½	.16 @
Central scrap and strip	.12½@.13½	.14 @.17	.17½@
Central wet sheet	.04½@.05½	.07 @.09	.11 @.12
Corinto scrap	.13½@.14½	.15½@.17½	.18½@
Esmeralda sausage	.13½@.14½	@	.18 @
Guayule washed and dried	.25 @.25½	.26 @	.27 @

Africans

Benguela, No. 1, 28½%	@	.10 @.11	.11 @.12
Benguela, No. 2, 32½%	@	.08 @	.10 @.11
Congo prime, black upper	@	.13 @.14	.14 @
Congo, prime, red upper	@	15 @	.16 @
Kassai, black	@	.12 @.13	.13 @
red	@	.14 @.15	.15 @

	December 1, 1921	December 1, 1922	December 26, 1922
Gutta Percha			
Gutta Siak	$0.16¼@.17	$0.17 @	$0.21 @.22
Red Macassar	2.75 @ 2.80	2.80 @	3.00 @
Balata			
Block, Ciudad Bolivar	.58 @.59	.58 @.60	.70 @.73
Colombia	.48 @.48½	.49 @.52	.58 @.60
Panama	.47 @.47½	.49 @.52	.50 @.52
Surinam sheet	.71 @.71½	.70 @.71	.77 @.80
amber	.74 @.74½	.74 @.75	.80 @.83
Chicle			
Colombia	@	.25 @.30	.25 @.30
Honduras	@	.62 @	.62 @
Venezuela	@	.63 @	.63 @
Yucatan fine	@	.65 @	.65 @

*Washed and dried crêpe. Shipment from Brazil.
† Nominal.

Reclaimed Rubber

The well-maintained advance in crude rubber has favored business in reclaimed rubber grades in marked degree. At present prices for crude rubber, manufacturers have begun to restore reclaim to their compounds in increasingly liberal proportions. The effect is very apparent on the reclaiming industry which is scheduling production at virtually full capacity with the beginning of the year. Revised quotations are as follows:

New York Quotations

December 26, 1922
Prices subject to change without notice

STANDARD RECLAIMS		
Floating	$0.13	@$0.14
Friction	.13	@ .14
Mechanical	.08	@ .11
Shoe, unwashed	.10	@ .11
Tires, auto	.08½	@ .11
truck	.09	@ .10
White	.13	@ .14

Comparative Low and High New York Spot Rubber Prices

	December 1922*	December 1921	December 1920
PLANTATIONS			
First latex crêpe	$0.26¾@$0.28	$0.18 @$0.21	$0.16¾@$0.19½
Smoked sheet, ribbed	.26¾@ .28	.18¼@ .21	.16 @ .18½
PARAS			
Upriver, fine	.23¾@ .25½	.22¾@ .24	.18 @ .20½
Upriver, coarse	.17 @ .18½	.14 @ .15½	.14 @ .15
Islands, fine	.22¼@ .23½	.21 @ .23	.18 @ .19
Islands, coarse	.12¼@ .17½	.10 @ .11	.11½@ .14½
Cametá	.09¾@ .12½	.10 @ .12	.11¾@ .14

*Figured to December 27, 1922.

New York Average Spot Rubber Prices

PRICES IN CENTS PER POUND

PLANTATIONS	October, 1922		November, 1922																					
Sheet	30	31	1	2	3	4	6	7*	8	9	10	11	13	14	15	16	17	18	20	21	22	23	24	25
Ribbed smoked	22⅜	22⅛	22	22½	22½	22⅝	22⅝	....	22¾	22⅞	23⅛	23½	23¾	23⅜	23⅞	24⅛	24⅛	24	23⅞	23⅞	23⅞	24⅛	24⅛	25⅛
Crêpe																								
First latex	22⅜	22⅛	22	22½	22½	22⅝	22⅝	....	22¾	22⅞	23⅛	23½	23¾	23⅜	23⅞	24⅛	24⅛	24	23⅞	23⅞	24	24⅛	24⅛	25⅛
Off latex	22	21⅞	21½	22	22⅛	22¼	22⅛	....	22⅜	22¾	23	23⅛	23½	23⅜	23⅝	23¾	23⅝	23⅛	23⅛	23½	23½	23⅞	24⅛	24⅞
No. 1 blanket	21⅞	22	21¾	22⅛	22⅛	22½	22½	....	22⅜	22⅝	23	23¼	23⅛	23½	23⅜	23⅝	23⅝	23⅛	23⅝	23⅝	23⅝	23¾	24⅜	24¾
No. 2 blanket	21¾	21½	21⅜	21¾	21¾	21¾	21¾	....	22⅛	22⅜	22¾	23	23⅛	23½	23⅜	23½	23⅜	23⅛	23¼	23¼	23⅜	23⅜	24½	24½
No. 3 blanket	21½	21½	21⅜	21½	21½	21¾	21¾	....	21⅞	22⅛	22½	22⅝	22⅞	23	23	23¼	23	22⅞	23	23	23⅛	23⅛	24½	24¼
Thin, clean, brown	21½	21¼	21	21½	21½	21⅝	21⅝	....	21⅞	22	22½	22½	22½	22¾	23	23	23	22⅞	22⅞	22⅞	22⅞	23⅛	23½	24¼
Specky brown	20⅝	20½	20⅛	20⅝	20½	20⅞	20¾	....	21	21¾	21⅝	21⅞	21⅞	22¼	22¼	22¼	22¼	22⅛	22½	22	22⅛	22½	23	23½
Rolled brown	20	19½	19½	20	20	20¼	20½	....	20½	20¾	21¼	21	21⅝	21⅝	21⅞	22	22	22	21⅞	21¾	21¾	22¼	22⅝	23

*Holiday.

	November, 1922				December, 1922																			
Sheet	27	28	29	30*	1	2	4	5	6	7	8	9	11	12	13	14	15	16	18	19	20	21	22	23†
Ribbed smoked	25⅞	26	26⅞	....	27⅜	27⅜	27¼	27¼	27	26¾	26⅞	26⅞	27⅜	27⅝	27¾	27⅝	27½	27½	27½	27⅜	27	27⅛	27⅛	....
Crêpe																								
First latex	26	26	26⅞	....	27⅜	27⅜	27¼	27¼	27	26¾	26⅞	26¾	27⅜	27⅝	27¾	27½	27½	27½	27½	27⅜	27	27⅛	27⅛	....
Off latex	25⅜	25½	26¼	....	26⅞	27	26⅞	26⅝	26⅝	26¼	26⅜	26½	26¾	27⅛	27⅜	27⅛	27⅛	27	27	26⅞	26⅝	26⅝	26⅝	....
No. 1 blanket	25⅝	25¾	26⅜	....	26⅞	26⅜	26¾	26⅝	26⅝	26⅜	26⅜	26¼	26¾	26⅞	27¼	27¼	27⅛	27	27⅛	27	26⅞	26¾	26⅞	....
No. 2 blanket	25⅛	25¼	26⅛	....	26⅝	26⅜	26½	26⅜	26⅜	26¼	26¼	26	26⅜	26⅝	27	27	26¾	26¾	26¾	26⅝	26⅝	26½	26⅝	....
No. 3 blanket	24⅞	25	25⅞	....	26⅜	26	26⅛	26⅛	26⅛	25⅞	25⅞	25⅜	26⅛	26⅛	26⅜	26⅜	26½	26⅜	26½	26⅛	26⅛	26⅛	26⅛	....
Thin, clean, brown	24⅞	25⅛	26	....	26½	26⅛	26⅛	26⅛	26	26	25⅞	25⅞	26⅛	26½	26⅝	26¾	26⅝	26⅝	26⅝	26½	26⅛	26⅛	26⅜	....
Specky brown	24½	24⅝	25	....	25¾	25⅝	25⅝	25⅝	25¾	25⅛	25⅛	25⅛	25⅝	25⅞	26⅛	26	75¾	26⅛	26⅛	25¾	25⅝	25¾	25¾	....
Rolled brown	24¼	23⅞	24½	....	25¼	24⅞	25⅜	25⅛	25¼	25⅛	24⅞	24⅞	25⅛	25½	25⅝	25⅛	25¾	25½	25⅛	25⅛	25¼	25⅛	25⅛	....

*Holiday. †No market.

Singapore Rubber Market

GUTHRIE & CO., Limited, Singapore, reports under date of October 13, 1922:

The usual weekly auction, held on Wednesday, opened to a quiet market weakened by profit taking. Demand was good, but prices were not up to sellers' expectations and a fair quantity of rubber was withdrawn.

No sales of standard sheet or crêpe were effected. Good average sheet sold at 28¼ cents, an advance of 2 cents. Pale crêpes were weak, fair average lots selling at 27¼ cents. Lower grades were strong at 2 cents up. Of 856 tons catalogd, 443 tons changed hands.

Subsequent to the sale the news of compulsory restriction of output to take effect from November 1 was published, and the market became excited, spot rubber rising to 35 cents.

The following is the course of values:

	In Singapore per Pound	Sterling Equivalent per Pound in London
Sheet, fine ribbed smoked	No sales	No sales
Sheet, good F. A. Q.	28 @ 28¼	—/ 8⅞ @ —/ 8⅞
Sheet, off quality	25 @ 27¾	—/ 8 @ —/ 8¾
Crêpe, fine pale	No sales	No sales
Crêpe, good pale	26½ @ 27½	—/ 9 @ —/ 9⅛
Crêpe, off quality	24½ @ 26½	—/ 8⅛ @ —/ 8⅞
Crêpe, fine brown	21¾ @ 24½	—/ 7⅝ @ —/ 8⅛
Crêpe, good brown	24¾ @ 26½	—/ 8⅛ @ —/ 8⅞
Crêpe, dark	21 @ 23½	—/ 7⅛ @ —/ 8⅛
Crêpe, bark	20¾ @ 21½	—/ 7⅛ @ —/ 7½

Singapore Rubber Market

GUTHRIE & CO., Limited, Singapore, reports, under date of November 17, 1922:

The rubber market continues to advance and values are again 2 cents up on the week.

The usual auctions, held yesterday, opened firm but bidding was slow with buyers feeling their way.

Standard sheet was bid for at 43¼ cents, but this grade was withdrawn and sold in the outside market at 43½ cents. Good F. A. Q. was in demand up to 42¾ cents, and relatively good prices were obtained for off-quality lots.

Pale crêpes were in short supply and received more attention, good quality lots fetching 42 to 43 cents. Off crêpes were a strong market. Lower grades were in keen demand, average clean browns realizing 39 to 40 cents. Of 745 tons catalogd, 414 tons were sold.

The following is the course of values:

	In Singapore per Pound	Sterling Equivalent per Pound in London
Sheet, fine ribbed smoked	No sales	No sales
Sheet, good F. A. Q.	42¼ @ 42¾	1/ 0⅞ @ 1/ 1
Sheet, off quality	36¾ @ 42	–/11¾ @ 1/ 0¾
Crêpe, fine pale	43 @	1/ 1½ @
Crêpe, good pale	41 @ 42¼	1/ 1 @ 1/ 1⅜
Crêpe, off quality	40 @ 41	1/ 0¼ @ 1/ 1
Crêpe, fine brown	39 @ 40	1/ 0⅛ @ 1/ 0¾
Crêpe, good brown	35 @ 40	–/11¼ @ 1/ 0¾
Crêpe, dark	35 @ 39	–/11¼ @ 1/ 0⅜
Crêpe, bark	33¼ @ 35½	–/10¾ @ –/11½

Amsterdam Rubber Market

JOOSTEN & JANSSEN, Amsterdam, report, under date of December 8, 1922:

After the market had been quite firm on Saturday and prices had gone up a cent, a rather sharp decline followed on Monday and since the market has remained very dull with little turnover and small fluctuation in price.

The market closed on its lowest level at the following prices:

Hevea crêpe, Fl. 71½. Sheets, Fl. 71½ spot.
Hevea crêpe, Fl. 73. Sheets, Fl. 73½ January to March.
Hevea crêpe, Fl. 74½. Sheets, Fl. 75 April to June.

British Malaya Rubber Exports

Official cablegrams from Singapore state that the exports of rubber from British Malaya in the month of October amounted to 61,523,500 pounds (27,466 tons) as against 20,238 tons in September and 15,028 tons in the corresponding month last year. Transhipments amounted to 3,126,700 pounds (1,396 tons) and foreign imports to 8,947,400 pounds (3,994 tons).

For the year from October, 1921, to September, 1922, the total export of rubber from all of the British Malayan ports amounted to 230,749 tons, with transhipments 22,326 tons approximately.

The exports of rubber from British Malaya in the month of November amounted to 48,477,400 pounds (21,642 tons) as against 27,466 tons in October and 17,941 tons in the corresponding month of last year. Transhipments amounted to 6,870,600 pounds (3,067 tons), and foreign imports to 11,575,400 pounds (5,168 tons).

Plantation Rubber Exports from Malaya

	January 1 to August 31, 1922			January 1 to October 12, 1922	
	Singapore Pounds	Malacca Pounds	Penang Pounds	Port Swettenham Pounds	Totals Pounds
To United Kingdom	3,159,300	9,038,800	3,641,500	12,969,355	28,808,955
The Continent	17,892,700	2,577,600	3,781,700	700,313	24,952,313
Japan	24,173,500	1,187,200	229,600	.....	25,590,300
United States	217,666,400	26,996,400	25,077,100	5,071,518	274,811,418
British Possessions	4,462,500	.....	94,600	757,966	5,315,066
Other countries	316,000	.....	3,200	.....	319,200
Totals	267,670,400	39,800,000	32,827,700	19,499,152	359,797,252

Plantation Rubber Exports from Java and Madura

	September		Nine Months Ended September 30	
	1921	1922	1921	1922
To Netherlands ..... kilos	289,000	94,000	4,638,000	2,750,000
Great Britain	328,000	209,000	6,399,000	3,668,000
Germany	26,000	137,000	380,000	905,000
France	.....	44,000	.....	215,000
Other Europe	24,000	.....	85,000	.....
Belgium	.....	.....	.....	11,000
United States	1,760,000	1,648,000	7,493,000	12,938,000
Italy	.....	57,000	.....	165,000
Singapore	154,000	51,000	1,961,000	2,048,000
Japan	160,000	21,000	286,000	127,000
Australia	.....	.....	211,000	93,000
Totals ..... kilos	2,741,000	2,261,000	21,453,000	22,920,000
Ports of origin:				
Tandjong Priok ..... kilos	1,068,000	1,205,000	9,495,000	9,581,000
Cheribon	.....	.....	.....	22,000
Samarang	25,000	43,000	341,000	525,000
Soerabaya	1,377,000	928,000	9,871,000	11,228,000
Banjcuwangi	.....	52,000	.....	399,000
Tjilatjap	174,000	7,000	809,000	616,000

Crude Rubber Arrivals at New York as Stated by Ships' Manifests

Parás and Caucho

	Fine	Medium	Coarse	Caucho	Totals Pounds
NOVEMBER 29. By "Pan America," Montevideo.					
Paul Bertuch	36,921	.....	5,049	6,215	48,185
DECEMBER 1. By "Benedick," Manáos, Iquitos and Pará.					
L. Littlejohn & Co., Inc.	6,615	.....	.....	.....	6,615
Meyer & Brown, Inc.	¶33,600	.....	.....	.....	33,600
Poel & Kelly, Inc.	252,118	11,685	6,334	.....	270,137
Ultramares Corporation	18,700	.....	3,500	9,500	31,700
DECEMBER 7. By "Boswell," Pará and Manáos.					
Paul Bertuch	122,339	15,350	143	117,144	254,976
General Rubber Co.	44,800	.....	.....	.....	‖134,400
Meyer & Brown, Inc.	¶64,960	.....	.....	.....	64,960
Poel & Kelly, Inc.	166,236	12,844	51,823	57,439	§314,095
Ultramares Corporation	39,000	.....	260	.....	39,260
DECEMBER 10. By "Dominic," Pará and Manáos.					
Paul Bertuch	44,076	.....	1,375	18,842	64,293
General Rubber Co.	112,000	.....	.....	.....	112,000
Meyer & Brown, Inc.	¶67,200	.....	.....	.....	67,200
Poel & Kelly, Inc.	60,000	14,089	26,109	31,990**	133,483
DECEMBER 11. By "Inga," Brazil.					
Poel & Kelly, Inc.	32,546	.....	14,028	.....	††55,587

¶Fine and medium. ‖Includes 89,600 lbs. of Cametá. §Includes 25,753 lbs. of Cametá. **Includes 1,300 lbs. of Cametá. ††Includes 9,013 lbs. of Cametá.

United States Crude and Waste Rubber Imports for 1922 (By Months)

	Plantations	Parás	Africans	Centrals	Guayule	Manicoba and Matto Grosso	Totals 1922	Totals 1921	Balata	Miscellaneous	Waste
January ..... tons	20,774	916	161	16	....	....	21,867	14,177	42	126	85
February	27,270	1,347	301	14	....	41	28,973	8,641	28	448	6
March	27,711	451	326	3	154	57	28,702	14,416	17	479	61
April	13,910	462	5	2	65	....	14,444	17,269	8	122	....
May	19,485	1,072	3	....	62	....	20,622	10,732	15	855	117
June	14,851	861	14	3	....	21	15,750	13,477	12	526	23
July	24,563	575	102	2	....	3	25,245	11,692	50	541	45
August	20,462	1,175	119	8	....	....	21,764	13,974	33	640	77
September	27,899	342	47	....	....	....	28,288	15,088	48	63	58
October	22,386	957	599	3	....	....	23,945	23,469	65	71	113
November	21,788	1,049	417	4	....	....	23,258	19,738	100	325	32
Totals, 11 months, 1922 .. tons	241,099	9,207	2,094	55	281	122	252,858	....	418	4,196	617
Totals, 11 months, 1921	150,379	10,318	1,836	79	58	3	....	162,673	477	2,264	1,833

Compiled by The Rubber Association of America, Inc.

Crude Rubber Arrivals at New York as Stated by Ships' Manifests—*Continued*

Plantations

(*Figured at 180 lbs. to the bale or case.*)

	Pounds	Totals
NOVEMBER 20. By "Zeeland," Southampton.		
Various	360	360
NOVEMBER 21. By "Port Albany," London.		
Various	1,114,020	1,114,020
NOVEMBER 24. By "Havana Maru," Far East.		
L. Littlejohn & Co., Inc.	537,600	
Poel & Kelly, Inc.	1,084,274	1,621,874
NOVEMBER 25. By "Kumeric," Far East.		
Baird Rubber & Trading Co., Inc.	56,000	
L. Littlejohn & Co., Inc.	963,200	
Fred Stern & Co., Inc.	56,000	
Charles T. Wilson Co., Inc.	257,600	
Poel & Kelly, Inc.	33,880	1,911,060
NOVEMBER 26. By "Maine," London.		
Various	18,720	18,720
NOVEMBER 26. By "Noordam," Rotterdam.		
Various	108,108	108,108
NOVEMBER 26. By "Caronia," Liverpool.		
Various	33,480	33,480
NOVEMBER 27. By "Kroonland," Far East.		
Baird Rubber & Trading Co., Inc.	17,450	
General Rubber Co.	44,800	
Various	386,530	448,780
NOVEMBER 28. By "Colon," Cristobal.		
Various	12,780	12,780
NOVEMBER 28. By "Mackinaw," London.		
Various	*14,940	14,940
NOVEMBER 28. By "Mount Clinton," Hamburg.		
Various	10,260	10,260
NOVEMBER 29. By "Kathlamba," Far East.		
Baird Rubber & Trading Co., Inc.	112,000	
General Rubber Co.	336,000	
L. Littlejohn & Co., Inc.	907,200	
Charles T. Wilson Co., Inc.	304,640	
Various	675,300	2,335,140
DECEMBER 1. By "City of Bristol," Far East.		
Baird Rubber & Trading Co., Inc.	199,360	
General Rubber Co.	674,016	
Hood Rubber Co.	*89,621	
J. T. Johnstone & Co., Inc.	308,000	
L. Littlejohn & Co., Inc.	2,983,260	
Meyer & Brown, Inc.	170,240	
Fred Stern & Co., Inc.	429,829	
Charles T. Wilson Co., Inc.	501,760	
Poel & Kelly, Inc.	577,995	
L. Littlejohn & Co., Inc.	*56,600	
Various	*221,579	6,211,600
DECEMBER 1. By "Rotterdam," Rotterdam.		
L. Littlejohn & Co., Inc.	739,200	739,200
DECEMBER 3. By "Esther Dollar," Far East.		
General Rubber Co.	221,760	
Hood Rubber Co.	*67,513	
L. Littlejohn & Co., Inc.	1,456,000	
Meyer & Brown, Inc.	616,000	
H. Muehlstein & Co.	392,000	
Fred Stern & Co., Inc.	158,707	
Charles T. Wilson Co., Inc.	95,260	
Poel & Kelly, Inc.	408,800	
Various	*107,807	
Various	†1,224,000	
Various	5,745,133	10,492,920
DECEMBER 3. By "Verbania," London.		
General Rubber Co.	454,720	
Various	129,560	584,280
DECEMBER 3. By "Andania," London.		
General Rubber Co.	610,400	610,400
DECEMBER 3. By "Lapland," London.		
General Rubber Co.	22,400	22,400
DECEMBER 4. By "Stadsdyk," Far East.		
General Rubber Co.	44,800	
L. Littlejohn & Co., Inc.	1,276,800	
Meyer & Brown, Inc.	33,600	
H. Muehlstein & Co.	680,960	
Poel & Kelly, Inc.	85,727	
Charles T. Wilson Co., Inc.	200,480	
Fred Stern & Co., Inc.	100,703	
Various	1,974,420	4,397,490
DECEMBER 4. By "Breedyk," Rotterdam.		
Various	*157,680	157,680
DECEMBER 6. By "President Van Buren," London.		
Various	37,260	37,260
DECEMBER 7. By "City of Benares," Far East.		
Baird Rubber & Trading Co., Inc.	56,000	
Paul Bertuch	22,400	
Hood Rubber Co.	*64,150	
L. Littlejohn & Co., Inc.	362,880	
H. Muehlstein & Co.	156,800	
Poel & Kelly, Inc.	11,170	
Fred Stern & Co., Inc.	2,240	
Charles T. Wilson Co., Inc.	150,080	
Various	245,530	1,071,250
DECEMBER 7. By "Homeric," Southampton.		
Various	1,080	1,080
DECEMBER 7. By "City of Lincoln," Far East.		
Baird Rubber & Trading Co., Inc.	112,000	
General Rubber Co.	517,440	
Hood Rubber Co.	*179,750	
J. T. Johnstone & Co., Inc.	522,368	
L. Littlejohn & Co., Inc.	2,213,200	
L. Littlejohn & Co., Inc.	*56,000	
Meyer & Brown, Inc.	268,800	
H. Muehlstein & Co.	*22,400	
H. Muehlstein & Co.	134,400	
Poel & Kelly, Inc.	306,955	
Fred Stern & Co., Inc.	78,400	
Charles T. Wilson Co., Inc.	257,600	
Various	2,897,377	7,566,690
DECEMBER 8. By "Antilochus," Far East.		
Baird Rubber & Trading Co., Inc.	179,200	
General Rubber Co.	1,385,641	
Hood Rubber Co.	*44,800	
J. T. Johnstone & Co., Inc.	165,008	
L. Littlejohn & Co., Inc.	*123,200	
Meyer & Brown, Inc.	826,560	
H. Muehlstein & Co	179,200	
H. Muehlstein & Co.	*100,800	
Poel & Kelly, Inc.	712,564	
Fred Stern & Co., Inc.	492,800	
L. Littlejohn & Co., Inc.	2,401,280	
Various	3,072,367	9,683,420
DECEMBER 9. By "Lingfield," Far East.		
Hood Rubber Co.	*53,300	
L. Littlejohn & Co., Inc.	896,000	
H. Muehlstein & Co.	78,400	
Poel & Kelly, Inc.	89,580	
Fred Stern & Co., Inc.	111,763	
Various	262,817	1,229,043
DECEMBER 9. By "Dacre Castle," Far East.		
Baird Rubber & Trading Co., Inc.	112,000	
Continental Rubber Co. of New York	22,400	
General Rubber Co.	1,260,454	
L. Littlejohn & Co., Inc.	2,678,880	
L. Littlejohn & Co., Inc.	*100,700	
Meyer & Brown, Inc.	257,600	
H. Muehlstein & Co.	134,400	
Poel & Kelly, Inc.	527,902	
Fred Stern & Co., Inc.	142,164	
Charles T. Wilson Co., Inc.	255,360	
Various	2,374,750	7,866,620
DECEMBER 11. By "West Canon," Far East.		
Baird Rubber & Trading Co., Inc.	211,690	
General Rubber Co.	565,264	
Hood Rubber Co.	22,548	
L. Littlejohn & Co., Inc.	1,180,480	
Meyer & Brown, Inc.	89,600	
H. Muehlstein & Co.	349,440	
Poel & Kelly, Inc.	574,608	
Fred Stern & Co., Inc.	188,937	
Charles T. Wilson Co., Inc.	502,880	
Various	2,019,033	5,704,480
DECEMBER 12. By "Gaasterdyk," Far East.		
L. Littlejohn & Co., Inc.	224,000	
Various	17,200	241,200
DECEMBER 12. By "Siberia Maru," Singapore.		
Fred Stern & Co., Inc.	‡22,417	22,417
DECEMBER 12. By "Sinasta," Hamburg.		
Various	5,040	5,040
DECEMBER 12. By "Mount Clay," Far East.		
L. Littlejohn & Co., Inc.	35,600	35,600
DECEMBER 13. By "President Polk," London.		
Baird Rubber & Trading Co., Inc.	22,026	22,026
DECEMBER 13. By "City of Sparta," Far East.		
Hood Rubber Co.	*12,080	
L. Littlejohn & Co., Inc.	560,000	
H. Muehlstein & Co.	100,800	
Poel & Kelly, Inc.	157,000	
Fred Stern & Co., Inc.	62,720	
Charles T. Wilson Co., Inc.	241,920	
Various	971,860	2,106,380
DECEMBER 14. By "East Cape," Far East.		
L. Littlejohn & Co., Inc.	147,600	
Fred Stern & Co., Inc.	56,000	
Various	2,740	216,340
DECEMBER 16. By "Clan Macbride," Far East.		
Poel & Kelly, Inc.	22,400	22,400
DECEMBER 17. By "Ryndam," Far East.		
Meyer & Brown, Inc.	44,800	
Poel & Kelly, Inc.	89,600	134,400

Rubber Latex

DECEMBER 3. By "Esther Dollar," Singapore.		
Various	134 cases	
DECEMBER 9. By "Dacre Castle," Singapore.		
Various	138,016 gal.	
Various	16,000 gal.	
DECEMBER 11. By "West Canon," Far East.		
Various	17 drums	
Various	16,000 gal.	
Various	18 drums	
Various	10 cases	

Africans

NOVEMBER 19. By "Baltic," Liverpool.		
Fred Stern & Co., Inc.	22,624	
Baird Rubber & Trading Co., Inc.	55,200	77,824
NOVEMBER 25. By "Cedric," Liverpool.		
Baird Rubber & Trading Co., Inc.	59,150	59,150
NOVEMBER 26. By "Caronia," Liverpool.		
Various	6,555	6,555
NOVEMBER 27. By "Kroonland," Antwerp.		
Baird Rubber & Trading Co., Inc.	40,890	40,890
DECEMBER 11. By "Obita," Hamburg.		
Poel & Kelly, Inc.	58,200	
Various	24,690	82,890

Pontianak

DECEMBER 3. By "Esther Dollar," Singapore.		
Various	60,600	60,600
DECEMBER 4. By "Stadsdyk," Far East.		
Various	104,700	104,700
DECEMBER 7. By "City of Lincoln," Far East.		
L. Littlejohn & Co., Inc.	33,000	
Various	100,200	133,200
DECEMBER 8. By "Antilochus," Singapore.		
L. Littlejohn & Co., Inc.	63,000	
Various	21,000	84,000
DECEMBER 9. By "Dacre Castle," Singapore.		
L. Littlejohn & Co., Inc.	250,000	250,000

Gutta Siak

NOVEMBER 29. By "City of Bristol," Singapore.		
L. Littlejohn & Co., Inc.	56,000	56,000
DECEMBER 3. By "Esther Dollar," Singapore.		
Various	3,000	3,000
DECEMBER 7. By "Antilochus," Singapore.		
L. Littlejohn & Co., Inc.	56,000	56,000
DECEMBER 9. By "Dacre Castle," Singapore.		
L. Littlejohn & Co., Inc.	56,000	
Various	8,500	64,500
DECEMBER 11. By "West Canon," Singapore.		
Various	11,200	11,200

Maniçobas

DECEMBER 1. By "Mount Clinton," Hamburg.		
Adolp Hirsch & Co., Inc.	8,500	8,500

Gutta Percha

NOVEMBER 26. By "Maine," London.		
Various	300	300
DECEMBER 4. By "Stadsdyk," Far East.		
L. Littlejohn & Co., Inc.	112,000	112,000
DECEMBER 8. By "Antilochus," Singapore.		
Various	63,900	63,900
DECEMBER 11. By "Carmania," Liverpool.		
Various	21,600	21,600

Balata

NOVEMBER 15. By "Advance," Colombia.		
Various	1,200	1,200
NOVEMBER 18. By "Panama," Cristobal.		
Various	8,925	8,925
NOVEMBER 24. By "Matura," Port of Spain.		
Various	9,600	9,600
NOVEMBER 27. By "Bogata," Cartagena.		
Various	2,400	2,400
NOVEMBER 28. By "Colon," Cristobal.		
Various	1,200	1,200
DECEMBER 3. By "Benedict," Pará.		
L. Littlejohn & Co., Inc.	11,000	
Various	17,320	28,320
DECEMBER 3. By "Paria," Far East.		
Middleton & Co., Ltd.	7,110	
Various	1,890	9,000
DECEMBER 4. By "Sixaola," Cristobal.		
Various	1,500	1,500
DECEMBER 8. By "Mayaro," Trinidad.		
Middleton & Co., Ltd.	6,720	
Various	6,275	12,995
DECEMBER 9. By "General W. C. Gorgas," Cristobal.		
Various	3,600	3,600
DECEMBER 10. By "Dominic," Para.		
Various	1,800	1,800

*Arrived at Boston.
†Arrived at Baltimore.
‡Arrived at San Francisco.

Exports of India Rubber Manufactures from the

EXPORTED TO—	Belting Value	Hose Value	Packing Value	Thread Value	Boots Pairs	Boots Value	Shoes Pairs	Shoes Value	Canvas Shoes with Rubber Soles Pairs	Canvas Shoes with Rubber Soles Value	Soles and Heels Value	Leather Cloth or Artificial Leather Value	Waterproofed and Auto Cloth and Auto Topping Value
EUROPE													
Austria	.....	.....	.....	.....	.....	.....	2,340	$3,074	.....	.....	.....	.....	.....
Belgium	$1,445	$1,222	$363	$3,614	.....	.....	20,384	15,526	.....	.....	$35	$865	$1,204
Czechoslovakia	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	365	.....
Denmark	562	65	308	.....	32	$81	9,976	14,515	3,135	$4,600	287	2,885	340
Esthonia	.....	.....	.....	.....	.....	.....	2,000	1,600	.....	.....	.....	.....	.....
Finland	1,344	39	.....	.....	.....	.....	.....	.....	.....	.....	.....	132	.....
France	3,474	1,830	253	31,636	.....	.....	489	224	.....	.....	.....	44,259	606
Germany	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Gibraltar	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Greece	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Iceland and Faroe Islands	.....	.....	.....	.....	966	2,322	3,058	7,410	.....	.....	.....	.....	.....
Italy	.....	.....	.....	4,891	2	15	48	41	191	176	.....	1,041	2,650
Jugoslavia, Albania, etc.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Malta, Gozo, etc.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Netherlands	3,042	824	.....	.....	.....	.....	.....	.....	.....	.....	.....	428	472
Norway	455	632	.....	.....	1,619	4,833	17,937	12,461	.....	.....	610	7,412	713
Poland and Danzig	.....	191	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Portugal	.....	599	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Rumania	.....	.....	.....	.....	.....	.....	28,400	33,955	.....	.....	.....	3,276	.....
Russia in Europe	.....	.....	.....	.....	50	182	.....	.....	.....	.....	.....	.....	.....
Spain	2,029	.....	.....	.....	.....	.....	.....	.....	.....	.....	433	9,615	963
Sweden	2,281	739	316	.....	.....	.....	432	205	.....	.....	1,024	10,622	567
Switzerland	.....	.....	.....	.....	.....	.....	10,879	7,302	.....	.....	.....	651	.....
Turkey in Europe	.....	.....	.....	.....	.....	.....	3,565	2,563	.....	.....	.....	.....	.....
Ukraine	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
England	2,915	7,556	5,518	48,627	9,003	15,519	11,903	14,210	2,788	2,380	4,134	13,613	5,015
Scotland	362	.....	653	.....	863	1,446	2,641	1,739	.....	.....	100	9,362	.....
Ireland	.....	.....	.....	.....	.....	.....	853	191	.....	.....	.....	.....	.....
TOTALS, EUROPE	$17,909	$13,697	$7,411	$88,768	12,535	$24,398	114,905	$115,016	6,114	$7,156	$6,623	$104,526	$12,530
NORTH AMERICA													
Canada—Maritime Provinces	$87	$881	$38	.....	190	$611	408	$675	.....	.....	$33	$109	$106
Quebec and Ontario	6,061	6,158	6,211	$4,111	716	2,202	2,556	4,518	80	$57	301	20,327	22,815
Prairie Provinces	515	228	56	30	36	104	32	61	24	35	.....	1,794	142
Brit. Columbia and Yukon	689	276	407	.....	780	2,841	139	329	.....	.....	.....	600	1,032
British Honduras	20	63	.....	.....	.....	.....	36	21	272	318	.....	.....	.....
Costa Rica	216	259	71	.....	.....	.....	.....	.....	.....	.....	431	.....	173
Guatemala	35	298	133	.....	.....	.....	.....	.....	2,583	2,012	593	.....	.....
Honduras	.....	482	329	.....	.....	.....	27	37	294	374	1,032	66	66
Nicaragua	710	131	583	.....	.....	.....	48	38	66	87	744	.....	66
Panama	1,022	239	101	.....	.....	.....	.....	.....	3,928	2,969	1,125	327	65
Salvador	198	61	36	288	.....	.....	.....	.....	120	83	1,985	.....	.....
Mexico	13,046	19,536	13,143	.....	81	360	20,782	17,606	11,442	11,121	11,744	3,627	1,875
Miquelon, etc.	12	.....	.....	.....	132	440	.....	.....	.....	.....	.....	.....	.....
Newfoundland and Labrador	1,251	577	58	.....	2,433	6,644	8,578	4,181	228	131	720	37	156
Bermuda	.....	.....	.....	.....	29	70	.....	.....	203	175	274	.....	25
Barbados	.....	.....	.....	.....	.....	.....	.....	.....	471	502	43	96	49
Jamaica	.....	34	731	.....	.....	.....	.....	.....	4,701	3,711	1,093	30	289
Trinidad and Tobago	671	1,277	193	.....	.....	.....	144	162	1,332	971	.....	.....	428
Other British West Indies	2,429	60	57	.....	.....	.....	.....	.....	4,016	4,139	21	.....	34
Cuba	6,557	12,008	6,085	.....	108	257	2,824	1,992	90,009	55,693	12,041	6,507	5,044
Dominican Republic	.....	174	300	.....	.....	.....	864	724	848	781	456	.....	.....
Dutch West Indies	14	406	26	.....	.....	.....	12	10	6,376	4,651	32	.....	43
French West Indies	610	.....	.....	.....	.....	.....	.....	.....	.....	.....	12	.....	.....
Haiti	128	113	507	.....	.....	.....	.....	.....	48	54	89	229	206
Virgin Islands of United States	.....	42	.....	.....	.....	.....	.....	.....	729	883	.....	.....	247
TOTALS, NORTH AMERICA	$34,271	$43,303	$29,065	$4,429	4,505	$12,529	30,354	$30,354	127,869	$88,747	$32,769	$33,749	$32,861
SOUTH AMERICA													
Argentina	$12,548	$7,866	$1,149	.....	803	$2,379	1,380	$979	35,300	$26,594	$3,986	$972	$9,999
Bolivia	.....	.....	.....	.....	.....	.....	.....	.....	132	140	.....	.....	.....
Brazil	11,681	6,580	1,663	$963	24	84	2,302	1,209	.....	.....	.....	978	4,434
Chile	2,136	3,733	212	.....	.....	.....	100	71	234	195	67	1,649	2,034
Colombia	1,843	189	101	.....	18	50	.....	.....	3,452	2,260	7,892	2,110	681
Ecuador	43	664	188	.....	.....	.....	.....	.....	.....	.....	494	152	.....
British Guiana	.....	.....	123	.....	.....	.....	456	476	300	291	.....	.....	.....
Dutch Guiana	.....	170	.....	.....	.....	.....	.....	.....	48	60	41	.....	.....
French Guiana	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Paraguay	543	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Peru	3,549	2,595	1,046	.....	146	623	1	1	599	615	259	411	150
Uruguay	.....	.....	361	.....	.....	.....	.....	.....	9,897	7,338	501	151	2,248
Venezuela	.....	540	315	.....	.....	.....	149	108	.....	.....	2,881	1,447	460
TOTALS, SOUTH AMERICA	$32,343	$22,337	$6,058	$963	991	$3,136	40,833	$2,844	49,962	$37,493	$16,121	$7,870	$20,006
ASIA													
Aden	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
British India	$2,469	$1,307	$423	.....	.....	.....	.....	.....	3,952	$4,831	$270	$107	.....
Ceylon	.....	.....	.....	.....	.....	.....	142	$105	220	164	.....	.....	.....
Straits Settlements	13	6	9	.....	.....	.....	.....	.....	314	309	.....	.....	$108
Other British East Indies	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
China	58	554	5	$520	142	$416	383	302	956	944	78	227	2,391
Chosen	.....	.....	.....	.....	.....	.....	72	64	.....	.....	.....	.....	.....
Java and Madura	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,408	174
Other Dutch East Indies	42	221	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
French Indo-China	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Hejaz, Arabia, etc.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Hongkong	32	44	338	.....	.....	.....	450	433	334	237	.....	1,242	2,459
Japan	2,084	1,816	2,767	8,001	900	1,566	3,504	3,606	.....	.....	.....	.....	.....
Palestine and Syria	.....	26	.....	.....	.....	.....	430	519	.....	.....	.....	.....	363
Persia	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Siam	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
TOTALS, ASIA	$11,698	$3,974	$3,542	$8,521	1,042	$1,982	4,981	$5,030	5,776	$6,485	$348	$2,984	$5,495

United States by Countries During October, 1922

Water-proofed Clothing Value	Pneumatic Casings: Automobile Number	Pneumatic Casings: Automobile Value	Pneumatic Casings: Others Value	Solid Tires: Automobile Value	Solid Tires: Others Value	Pneumatic Tubes: Automobile Number	Pneumatic Tubes: Automobile Value	Pneumatic Tubes: Others Value	Tire Repair Materials Value	Druggists' Rubber Sundries Value	Hard Rubber Goods: Battery Jars and Accessories Value	Hard Rubber Goods: Other Electrical Supplies Value	Hard Rubber Goods: Others Value	All Other Rubber Manufactures Value	Totals Value
.....	.....	.....	$883	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	$3,074
.....	1,508	$19,670	$883	.....	.....	553	$1,136	.....	$604	$2,137	.....	.....	$59	$1,161	49,924
.....	130	2,218	.....	.....	.....	260	636	.....	.....	.....	.....	.....	.....	.....	3,219
$882	1,716	22,709	68	$4,360	.....	1,046	2,367	.....	625	405	.....	.....	46	1,007	56,112
.....	30	848	.....	.....	.....	40	98	.....	.....	.....	.....	.....	.....	.....	2,546
.....	118	2,020	.....	.....	.....	62	154	.....	803	.....	.....	.....	.....	319	4,811
.....	2,498	30,296	983	.....	.....	677	1,078	.....	366	2,629	$3,139	$3,063	5,947	4,372	134,125
.....	20	330	.....	.....	.....	58	97	.....	.....	79	.....	.....	.....	16	522
.....	118	1,374	.....	60	.....	78	157	.....	.....	.....	.....	.....	.....	.....	1,591
.....	649	8,755	.....	.....	.....	560	1,090	.....	.....	.....	.....	.....	.....	4	9,849
.....	3	57	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	90	.....	9,879
.....	1,018	16,372	1,252	.....	.....	1,850	3,924	$118	.....	735	.....	.....	.....	815	32,030
.....	86	2,058	.....	.....	.....	126	323	.....	.....	.....	.....	.....	.....	.....	2,381
.....	136	1,326	.....	.....	.....	128	173	.....	.....	.....	.....	.....	.....	.....	1,499
69	752	10,461	76	718	$258	288	1,022	37	162	300	.....	.....	.....	2,953	20,822
.....	865	15,102	346	1,442	.....	579	1,237	112	335	.....	55	.....	.....	67	45,812
.....	125	1,973	.....	.....	.....	663	1,327	.....	.....	.....	.....	.....	.....	.....	3,491
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	599
.....	403	7,731	.....	.....	.....	529	1,520	.....	637	.....	.....	.....	.....	98	47,217
.....	64	947	.....	.....	.....	4	9	.....	.....	.....	.....	.....	.....	200	1,338
.....	441	6,567	.....	2,345	.....	82	397	140	1,645	14	.....	.....	.....	542	24,690
.....	7,523	136,394	2,838	7,476	.....	7,320	16,114	986	1,219	165	.....	.....	.....	296	184,242
.....	240	3,682	579	.....	.....	.....	.....	33	.....	24	.....	.....	.....	364	12,635
.....	266	5,208	.....	52	.....	308	687	.....	.....	.....	.....	.....	.....	4	8,514
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,920	1,920
3,434	22,248	204,488	74	24,698	.....	7,034	12,625	747	4,471	50,011	411	.....	17,142	31,842	469,430
941	27	325	.....	.....	.....	.....	.....	.....	.....	209	.....	.....	.....	78	15,215
.....	200	1,304	.....	.....	.....	450	568	.....	.....	.....	.....	.....	.....	.....	2,063
$5,326	41,175	$505,215	$7,099	$41,151	$258	22,695	$46,739	$2,173	$10,867	$56,708	$3,575	$3,063	$23,284	$46,058	$1,149,550
$361	129	$1,999	$106	.....	$45	22	$53	$28	$48	$110	$202	.....	$196	$1,216	$6,904
2,352	1,216	17,480	.....	$4,992	2,821	1,258	2,798	.....	1,494	12,185	840	$964	12,712	61,662	193,061
115	108	1,575	11	318	.....	127	170	.....	106	937	41	121	273	1,764	8,396
1,679	346	4,747	188	632	160	136	307	.....	18	1,317	.....	112	96	2,617	18,047
68	27	192	.....	.....	.....	14	22	.....	16	39	.....	.....	.....	69	828
125	54	1,220	20	.....	46	18	55	.....	75	.....	.....	.....	.....	21	2,712
.....	81	1,896	80	.....	.....	126	203	6	16	46	.....	.....	.....	70	5,388
1,646	9	210	.....	.....	.....	8	33	.....	.....	186	.....	.....	.....	44	4,508
36	18	240	14	.....	.....	88	154	.....	.....	86	.....	.....	.....	59	2,948
60	665	6,733	297	2,166	525	601	1,032	38	131	5	594	2	67	978	18,476
.....	70	1,663	.....	432	.....	154	317	.....	.....	100	.....	.....	63	16	5,242
4,444	9,014	137,689	2,457	9,207	1,770	6,797	29,063	294	1,018	1,793	.....	3,013	1,894	8,705	293,405
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	452
901	8	137	5	.....	52	9	12	.....	14	131	.....	458	114	824	16,403
83	4	124	.....	206	158	4	12	.....	.....	20	.....	.....	.....	44	1,191
.....	149	1,754	.....	.....	.....	87	149	.....	.....	.....	.....	.....	.....	44	2,637
51	499	6,313	.....	1,536	281	563	981	.....	10	.....	.....	.....	23	431	15,514
275	337	4,150	.....	218	.....	268	361	.....	15	.....	.....	12	.....	338	9,071
.....	56	670	205	.....	.....	156	198	44	17	.....	.....	30	.....	126	8,030
4,448	6,339	72,229	1,935	10,937	.....	8,613	12,980	290	1,571	3,091	7	.....	236	11,007	224,915
10	713	9,804	.....	225	411	1,225	2,163	.....	10	61	.....	.....	173	554	15,846
58	58	616	.....	.....	.....	62	124	12	9	.....	.....	.....	.....	455	6,456
25	251	3,064	.....	.....	135	189	291	.....	.....	.....	.....	.....	.....	.....	4,137
148	151	2,152	.....	.....	109	192	359	10	26	200	.....	.....	.....	26	4,350
.....	4	265	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	29	1,466
$16,888	20,305	$276,922	$5,318	$30,869	$6,513	20,717	$51,837	$722	$4,594	$20,307	$1,684	$4,712	$15,847	$91,093	$870,383
$720	14,030	$138,058	.....	$670	$417	6,924	$9,166	$82	$573	$2,755	.....	$347	$855	$8,390	$228,505
372	498	3,427	.....	.....	.....	228	320	.....	.....	.....	.....	.....	.....	.....	4,259
246	6,624	79,550	$51	2,403	.....	6,181	8,194	101	137	585	.....	137	660	1,737	121,393
.....	1,031	14,692	.....	303	170	1,247	3,717	8	184	211	.....	.....	803	620	30,805
542	625	10,729	.....	206	505	549	1,479	.....	33	1,110	.....	73	643	595	31,041
.....	122	1,980	.....	211	.....	152	314	.....	.....	.....	.....	.....	.....	156	4,202
600	130	1,067	.....	.....	.....	67	84	.....	.....	40	.....	.....	.....	164	2,845
.....	22	280	.....	.....	.....	.....	.....	.....	6	.....	.....	.....	.....	.....	557
.....	60	525	.....	.....	.....	24	34	.....	.....	.....	.....	.....	.....	.....	559
.....	50	409	.....	.....	.....	60	98	.....	.....	.....	.....	.....	.....	.....	1,050
1,128	680	10,575	150	538	.....	659	1,536	.....	.....	101	.....	.....	115	660	24,952
633	3,569	41,734	140	.....	.....	1,124	2,071	48	74	.....	.....	.....	.....	988	56,287
360	313	4,290	186	380	.....	600	1,085	70	54	460	.....	.....	.....	757	13,393
$4,601	27,754	$307,316	$527	$4,711	$1,092	17,815	$28,098	$309	$1,061	$5,262	.....	$557	$3,076	$14,067	$519,848
.....	92	$1,148	.....	.....	.....	16	$30	.....	.....	.....	.....	.....	.....	.....	$1,178
.....	785	8,826	.....	$1,520	.....	408	654	$54	.....	$439	.....	.....	.....	$94	20,994
.....	101	1,220	.....	317	.....	37	75	.....	.....	.....	.....	.....	.....	59	1,941
.....	366	3,955	.....	582	.....	833	1,274	.....	.....	.....	.....	.....	.....	.....	6,256
.....	.....	.....	.....	.....	.....	.....	.....	.....	$258	.....	.....	.....	.....	.....	258
.....	356	4,674	.....	1,505	.....	88	175	.....	482	1,376	.....	$9	.....	782	14,498
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	138	.....	.....	.....	10	212
.....	440	5,420	$795	4,860	$908	30	45	40	.....	.....	.....	100	.....	91	13,841
.....	262	4,587	452	2,194	.....	148	407	768	.....	.....	.....	.....	.....	.....	8,671
.....	150	2,100	.....	.....	.....	102	525	.....	299	.....	.....	.....	.....	.....	2,924
.....	414	3,830	.....	.....	.....	110	232	.....	.....	.....	.....	.....	.....	.....	4,062
.....	40	833	81	.....	.....	30	50	36	210	95	.....	434	.....	10	6,534
$25	345	5,817	.....	1,426	.....	145	413	.....	72	1,087	$320	.....	.....	1,746	37,746
.....	352	8,007	.....	.....	.....	298	641	.....	.....	.....	.....	.....	.....	715	10,271
.....	100	1,043	.....	.....	.....	4	6	.....	.....	.....	.....	.....	.....	.....	1,049
.....	24	234	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	234
$25	3,827	$51,694	$1,328	$12,404	$908	2,249	$4,527	$898	$1,321	$3,135	$320	$543	.....	$3,507	$130,669

Exports of India Rubber Manufactures from the United

	Belting Value	Hose Value	Packing Value	Thread Value	Boots Pairs	Boots Value	Shoes Pairs	Shoes Value	Canvas Shoes with Rubber Soles Pairs	Canvas Shoes with Rubber Soles Value	Soles and Heels Value	Leather Cloth or Artificial Leather Value	Waterproofed and Auto Cloth and Auto Topping Value
OCEANIA													
Philippine Islands	$1,736	$2,023	$818	.....	.....	.....	.....	.....	24,645	$21,988	$8,974	$1,114	.....
Australia	8,715	6,081	3,915	.....	.....	.....	378	$1,109	7,818	4,839	.....	33,122	$2,411
British Oceania	.....	.....	.....	.....	.....	.....	.....	.....	360	518	.....	.....	219
French Oceania	27	37	395	.....	.....	.....	.....	.....	944	1,068	.....	.....	61
New Zealand	4,783	2,088	999	.....	.....	.....	.....	.....	70	139	.....	553	225
Other Oceania	.....	.....	.....	.....	.....	.....	.....	.....	260	370	.....	.....	.....
TOTALS, OCEANIA	$15,261	$10,229	$6,127	.....	.....	.....	378	$1,109	34,097	$28,922	$8,974	$34,789	$2,916
AFRICA													
British West Africa	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	$460	.....
British South Africa	$27,745	$9,889	$1,281	$173	1,399	$3,165	536	$769	2,123	$1,698	$611	3,474	$530
British East Africa	151	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	592	252
Canary Islands	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	324	163	.....
Egypt	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	115	.....	.....
Algeria and Tunis	110	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Other French Africa	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Portuguese East Africa	9,044	108	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
TOTALS, AFRICA	$37,050	$9,997	$1,281	$173	1,399	$3,165	536	$769	2,123	$1,698	$1,050	$4,689	$782
GRAND TOTALS	$148,532	$103,537	$53,484	$102,854	20,472	$46,210	161,638	$155,122	225,941	$170,501	$65,885	$188,607	$74,590

Compiled by the Bureau of Foreign Commerce, Department of Commerce, Washington, D. C.

Official India Rubber Statistics for the United States

Imports of Crude and Manufactured Rubber

	September, 1921 Pounds	September, 1921 Value	September, 1922 Pounds	September, 1922 Value
UNMANUFACTURED—*free*				
India rubber				
From France	.....	.....	224,120	$20,171
Netherlands	1,362,870	$221,670	67,195	11,782
United Kingdom	5,123,590	744,497	807,324	118,079
Brazil	1,535,785	165,565	976,697	132,945
Peru	65,816	6,979	216,505	33,653
Other South America	4,712	1,350	5,150	990
British East Indies	21,374,193	2,923,003	35,011,219	4,805,658
Dutch East Indies	5,068,245	689,533	7,007,468	1,072,789
Other countries	11,200	844	29,184	6,678
Totals	34,546,411	$4,753,441	44,344,862	$6,202,136
Balata	218,102	123,896	119,332	79,260
Jelutong (Pontianak)	250,456	14,866	28,140	2,825
Gutta percha	166,170	22,419	52,956	8,946
Guayule	.....	.....	.....	.....
Rubber scrap	338,239	13,267	114,925	4,979
Totals, unmanufactured	35,519,378	$4,927,883	44,660,215	$6,298,146
Chicle *dutiable*	286,765	$136,980	300,833	$144,464
MANUFACTURED—*dutiable*				
India rubber and gutta percha	.....	$119,277	.....	$110,114
India rubber substitutes	.....	.....	.....	.....

Exports of Domestic Merchandise

MANUFACTURED				
India rubber				
Reclaimed	57,519	$5,060	160,310	$15,473
Scrap and old	296,203	14,613	563,542	22,684
Footwear				
Boots[1] *pairs*	46,435	103,789	22,059	54,936
Shoes[1] *pairs*	211,227	186,613	196,242	118,023
Canvas shoes with rubber soles[1] *pairs*	.....	.....	189,927	152,351
Druggists' rubber sundries[1]	.....	61,773	46,967	55,660
Hard rubber goods				
Battery jars and accessories[1]	.....	.....	20,875	5,391
Other electrical supplies[1]	.....	.....	5,583	3,083
Other hard rubber goods[1]	.....	.....	42,332	41,895
Tires				
Pneumatic casings				
For automobiles[1]	.....	940,333	107,457	1,241,360
Other[1]	.....	.....	3,533	9,971
Pneumatic tubes				
For automobiles[1]	.....	97,528	72,858	129,481
Other[1]	.....	.....	3,812	4,388
Solid tires				
For automobile and motor trucks[1]	.....	97,523	4,186	112,897
Other[1]	.....	.....	118,684	29,967
All other tires[1]	.....	26,574	.....	.....
Tire repair materials[1]	.....	.....	60,011	22,960
Belting[1]	.....	76,349	232,025	111,953
Hose[1]	.....	57,758	269,267	105,406
Packing[1]	.....	64,263	119,778	56,678
Soles and heels[1]	.....	31,058	164,553	61,469
Thread[1]	.....	.....	98,018	99,125
Other rubber manufactures[1]	.....	338,293	340,925	204,157
Totals, manufactured	.....	$2,101,527	.....	$2,659,308

Exports of Foreign Merchandise

	September, 1921 Pounds	September, 1921 Value	September, 1922 Pounds	September, 1922 Value
UNMANUFACTURED				
India rubber	1,312,192	$231,916	837,065	$122,981
Balata	122,750	36,354	31,624	15,438
Jelutong (Pontianak)	.....	.....	.....	.....
Totals, unmanufactured	1,434,942	$268,270	868,689	$138,419
MANUFACTURED				
Gutta percha and india rubber	.....	$8,357	.....	$783
India rubber substitutes	.....	.....	.....	.....
Totals, manufactured	.....	$8,357	.....	$783

[1]Details of exports of domestic merchandise by countries during September, 1922, appeared on pages 194 to 197 of our December issue.

United Kingdom Rubber Imports and Exports

Imports

FROM	September 1922	September 1921	September 1920	Nine Months Ended September 30 1922	Nine Months Ended September 30 1921	Nine Months Ended September 30 1920
Straits Settlements and Federated Malay States *tons*	2,543	2,719	5,445	28,682	39,948	43,066
Ceylon and British India	1,129	1,281	2,089	9,457	14,864	19,540
Dutch East Indies, etc.	383	745	617	5,877	12,698	8,737
Brazil and Peru	143	129	362	2,097	1,596	7,054
Other countries	85	22	567	420	578	2,728
Totals *tons*	4,283	4,896	9,080	46,533	69,684	81,125

Exports

To	September 1922	September 1921	September 1920	Nine Months Ended September 30 1922	Nine Months Ended September 30 1921	Nine Months Ended September 30 1920
United States *tons*	672	3,348	122	16,345	11,876	24,751
Canada	109	22	305	806	59	2,932
France	1,025	958	591	9,535	4,606	10,846
Belgium	35	114	66	901	794	1,922
Italy	315	143	58	1,931	860	2,472
Spain	17	20	21	313	104	161
Germany, Austria, Hungary	379	705	332	6,022	5,919	3,385
Russia	1,695	.....	11	1,725	163	40
Sweden, Norway and Denmark	61	5	197	427	604	953
Other countries in Europe	62	399	121	835	1,809	663
Other countries	22	.....	82	267	41	969
Totals *tons*	4,392	5,714	1,906	39,107	26,835	49,094

Compiled by the Rubber Trade Association of London.

"SURE SEAL" COLD PACK RUBBER RINGS FOR MASON FRUIT JARS are manufactured by the Anchor Cap & Closure Corporation, Long Island City, New York.

States by Countries During October, 1922—*Continued*

	Waterproofed Clothing Value	Pneumatic Casings: Automobile Number	Pneumatic Casings: Automobile Value	Pneumatic Casings: Others Value	Solid Tires: Automobile Value	Solid Tires: Others Value	Pneumatic Tubes: Automobile Number	Pneumatic Tubes: Automobile Value	Pneumatic Tubes: Others Value	Druggists' Tire Repair Materials Value	Druggists' Rubber Sundries Value	Hard Rubber Goods: Battery Jars and Accessories Value	Hard Rubber Goods: Other Electrical Supplies Value	Hard Rubber Goods: Others Value	All Other Rubber Manufactures Value	Totals Value
	$255	2,798	$40,292	$178	$3,320	$2,784	1,611	$3,266	.....	$320	$1,092	.....	.....	$138	$3,107	$91,405
	.....	5,051	85,964	2,670	14,733	.....	3,321	6,686	$201	2,724	2,147	$64	$37	559	6,970	182,947
	.....	539	9,046	.....	2,359	.....	546	1,195	.....	.....	.....	.....	.....	.....	637	13,974
	.....	17	401	.....	79	.....	16	41	.....	16	.....	.....	.....	.....	5	2,130
	.....	3,947	49,230	.....	12,850	.....	617	1,432	.....	1,048	1,506	.....	.....	.....	1,649	76,502
	.....	215	2,133	.....	833	.....	143	230	.....	.....	.....	.....	188	.....	.....	3,754
	$255	12,567	$187,066	$2,848	$34,174	$2,784	6,254	$12,850	$201	$4,108	$4,745	$64	$225	$697	$12,368	$370,712
	.....	473	$7,806	.....	$951	.....	541	$1,410	.....	.....	.....	.....	.....	.....	.....	$10,627
	$3,231	5,542	65,078	$641	1,748	.....	2,691	4,148	$287	$405	$302	.....	.....	.....	$7,686	132,861
	.....	692	6,929	.....	.....	.....	430	819	42	.....	.....	.....	.....	.....	41	8,826
	.....	319	4,913	.....	721	.....	332	592	.....	.....	.....	.....	.....	.....	.....	6,713
	.....	335	2,833	.....	.....	.....	86	188	.....	25	.....	.....	.....	.....	66	3,227
	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	110
	.....	12	283	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	283
	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	276	9,422
	$3,231	7,372	$87,842	$641	$3,420	.....	4,080	$7,157	$329	$430	$302	.....	.....	.....	$8,063	$172,069
	$30,326	113,000	$1,416,055	$17,761	$126,729	$11,555	73,810	$151,208	$4,632	$22,381	$90,459	$5,643	$9,100	$42,904	$175,156	$3,213,231

Rubber Statistics for the Dominion of Canada

Imports of Crude and Manufactured Rubber

	September, 1921 Pounds	September, 1921 Value	September, 1922 Pounds	September, 1922 Value
UNMANUFACTURED—*free*				
Rubber, gutta percha, etc.				
From United Kingdom	52,193	$5,890	203,138	$28,418
United States	1,029,137	155,488	755,239	107,882
Belgium	27,731	1,409	.....	.....
British East Indies				
Ceylon	.....	.....	224,000	34,535
Straits Settlements	54,121	7,790	232,254	34,218
France	.....	.....	4,599	1,564
Totals	1,163,182	$170,577	1,419,230	$206,617
Rubber, recovered	53,607	6,310	90,890	8,265
Rubber, powdered, and rubber or gutta percha scrap	42,749	4,157	201,692	4,755
Balata	.....	.....	11,254	1,548
Rubber substitutes	40,076	6,110	8,519	1,117
Totals, unmanufactured	1,299,614	$187,154	1,731,585	$222,302
PARTLY MANUFACTURED				
Hard rubber sheets and rods	297	$368	871	$847
Hard rubber tubes	.....	1,081	.....	1,492
Rubber thread, not covered	3,813	4,885	6,892	7,379
Totals, partly manufactured	4,110	$6,334	7,763	$9,718
MANUFACTURED				
Belting	.....	$6,114	.....	$10,807
Hose	.....	11,435	.....	10,959
Packing	.....	5,577	.....	3,461
Boots and shoes ..... *pairs*	.....	14,274	5,461	16,668
Clothing, including waterproofed	.....	16,489	.....	12,265
Gloves	.....	1,109	.....	1,685
Hot water bottles	.....	523	.....	506
Tires, solid	.....	16,946	.....	14,307
Tires, pneumatic	.....	60,615	.....	64,690
Inner tubes	.....	7,654	.....	5,965
Elastic, round or flat	.....	27,510	.....	37,405
Mats and matting	.....	4	.....	4,396
Cement	.....	2,722	.....	3,895
Other rubber manufactures	.....	78,104	.....	81,108
Totals, manufactured	.....	$249,076	.....	$268,117
Totals, rubber imports	1,303,724	$442,564	1,739,348	$500,137

Exports of Domestic and Foreign Rubber Goods

	September, 1921 Produce of Canada Value	September, 1921 Reexports of Foreign Goods Value	September, 1922 Produce of Canada Value	September, 1922 Reexports of Foreign Goods Value
UNMANUFACTURED				
Crude and waste rubber	$4,993	$100	$1,446	.....
MANUFACTURED				
Belting	$749	.....	$7,084	.....
Canvas shoes with rubber soles	14,964	.....	115,591	.....
Boots and shoes	67,024	.....	61,796	.....
Clothing, including waterproofed	317	.....	.....	.....
Hose	7,983	.....	25,182	.....
Tires, casings	.....	.....	394,894	.....
inner tubes	.....	.....	29,632	.....
pneumatic	203,593	.....	.....	.....
solid	2,555	.....	5,988	.....
vehicle	.....	$1,607	.....	$754
Other rubber manufactures	7,268	.....	13,005	.....
Totals, manufactured	$304,453	$1,607	$653,172	$754
Totals, rubber exports	$309,446	$1,707	$654,618	$754

JAPAN'S RUBBER MANUFACTURING INDUSTRY

That Japan is one of the world's chief markets for rubber goods has been evident for some time. Few people realize, however, the extent of her rubber manufacturing industry. Japan has in the Malay Peninsula rubber plantations which in 1918 were estimated at 93,803 acres, while she is also extending her activities in the Dutch East Indies. Her importations of crude rubber, almost wholly from the Straits Settlements and India, totaling in 1915 only 29,276 piculs (1 picul 132.28 pounds), increased in 1921 to 389,162 piculs, or 51,476,793 pounds.

The following table shows the development of Japan's rubber manufacturing industry.

Year	Factories	Employes	Output in Yen*
1915	265	5,043	6,703,796
1916	154	7,137	11,240,169
1917	166	6,618	15,028,864
1918	188	8,245	22,955,559
1919	327	11,543	32,432,324

* One yen equals $0.4985 at normal exchange.

There were also 28 insulated wire factories in 1919, employing 3,654 persons, the value of the output being 26,554,500 yen, as compared with 17 firms employing 1,134 persons, and an output valued at 4,357,643 yen in 1915.

The next table illustrates the magnitude of the tire industry, the Dunlop Rubber Company (Far East), Limited, at Kobe, being one of the most important organizations. Articles made in the rubber factories of Japan, however, cover a wide range, toys being one of the most important products.

	1917 Yen	1918 Yen	1919 Yen	1920 Yen	1921 Yen
Rubber tires	2,176,225	4,506,000	7,114,037	8,018,064	4,478,426
Various rubber goods	614,230	1,225,000	2,510,000	1,527,000	771,979
Rubber toys, etc.	228,420	766,540	1,339,734	2,574,665	1,248,621
Insulated wire	3,118,000	8,324,000	8,411,700	8,043,332	3,273,092
Totals	6,136,875	14,821,540	19,375,471	20,163,061	9,772,118

DECLINE IN RUBBER EXPORTS FROM UGANDA PROTECTORATE

Exports of plantation rubber from the Uganda Protectorate for the calendar years 1920 and 1921 represent a decline during the latter period, both as to quantity and value. In 1920, 446,427 pounds, valued at £32,521, were shipped, while in 1921 the estimate appears as 74,002 pounds, valued at £4,441. Figures indicating the decline are 372,425 pounds, worth £28,080.

The Tidewater Chemical Co., Inc., 440 Washington street, New York, N. Y., formerly Katzenbach & Bullock, Inc., announces the resignation of E. L. Bullock, for the last year in charge of its sales department. Its policy remains unchanged.

United Kingdom Rubber Statistics

Imports

	October, 1921		October, 1922	
	Pounds	Value	Pounds	Value
UNMANUFACTURED				
Crude rubber				
From—				
Straits Settlements	2,507,300	£108,506	3,880,500	£170,321
Federated Malay States	5,208,900	216,376	2,379,500	103,107
British India	402,400	15,384	216,100	8,873
Ceylon and Dependencies	2,574,300	106,743	1,537,400	66,989
Other Dutch Possessions in Indian Seas	675,400	26,667	68,500	3,015
Dutch East Indies (except other Dutch Possessions in Indian Seas)	945,400	41,218	487,900	19,485
Other countries in East Indies and Pacific, not elsewhere specified	191,100	9,248	92,600	4,566
Brazil	399,200	16,424	2,310,600	94,935
South and Central America (except Brazil and Peru)	900	34	40,300	1,650
West Africa				
French West Africa	400	15	10,100	357
Other parts of West Africa	.....	.....	17,500	568
East Africa, including Madagascar	700	28	42,800	1,143
Other countries	10,600	479	84,700	3,401
Totals	12,916,600	£541,122	11,168,500	£478,350
Waste and reclaimed rubber	22,000	363	47,800	429
Gutta percha and balata	579,100	95,104	907,100	104,282
Rubber substitutes	.....	.....	22,600	678
Totals, unmanufactured	13,517,700	£636,589	12,146,000	£623,739
MANUFACTURED				
Boots and shoes..*dozen pairs*	4,259	£15,590	6,864	£18,337
Tires and tubes.....*number*	141,587	387,325	271,192	284,318
Other rubber manufactures	.....	64,928	.....	66,030
Totals, manufactured	.....	£467,843	.....	£368,685
Waterproof clothing..*number*	2,801	£1,855	7	£21
Insulated wire	.....	6,636	.....	17,774
Submarine cables	.....	.....	.....	.....

Exports

UNMANUFACTURED				
Waste and reclaimed rubber	469,300	£8,024	184,900	£2,831
Rubber substitutes	84,400	2,005	219,100	5,415
Totals, unmanufactured	553,700	£10,029	404,000	£8,246
MANUFACTURED				
Boots and shoes..*dozen pairs*	11,479	£24,723	16,300	£31,233
Tires and tubes.....*number*	156,867	171,476	141,398	138,491
Other rubber manufactures	.....	208,450	.....	224,561
Totals, manufactured	.....	£404,649	.....	£394,285
Waterproof clothing..*number*	75,960	£105,521	117,322	£133,926
Insulated wire	.....	59,368	.....	80,562
Submarine cables	.....	9,373	.....	36,467

Exports—Colonial and Foreign

	October, 1921		October, 1922	
	Pounds	Value	Pounds	Value
UNMANUFACTURED				
Crude rubber				
To Russia	600	£30	2,011,500	£62,549
Sweden, Norway and Denmark	180,200	6,277	86,400	2,841
Germany	2,051,400	70,526	813,300	30,138
Belgium	255,400	9,694	88,700	2,935
France	3,075,500	122,350	3,390,200	114,758
Spain	62,600	2,492	64,400	2,255
Italy	585,300	24,390	355,500	11,351
Austria	10,500	249	2,700	87
Other European countries	1,271,200	42,791	54,400	2,630
United States	6,900,100	256,296	5,445,300	176,218
Canada	123,100	5,305	630,200	23,440
Other countries	10,400	458	108,700	4,823
Totals	14,526,300	£540,858	13,051,300	£434,025
Waste and reclaimed rubber	2,900	51	1,000	10,217
Gutta percha and balata	56,600	6,678	80,000	25
Rubber substitutes	.....	.....	2,200	70
Totals, unmanufactured	14,585,800	£547,587	13,134,500	£444,337
MANUFACTURED				
Boots and shoes..*dozen pairs*	329	£928	379	£1,735
Tires and tubes.....*number*	8,762	33,989	9,183	15,752
Other rubber manufactures	.....	3,316	.....	4,626
Totals, manufactured	.....	£38,233	.....	£22,113
Waterproof clothing..*number*	200	£90	.....	.....
Insulated wire	.....	141	.....	£98
Submarine cables	.....	.....	.....	.....

The Market for Rubber Scrap

New York

The increased activity in reclaimed rubber production brought about by the continued advance in crude rubber has stimulated the rubber scrap market in like degree.

Boots and shoes are in good request. Stocks generally are being held in reserve in anticipation of prices above 4 cents a pound at around which figure shoes could be delivered the middle of the month. No. 1 inner tubes are fairly active, the firm prices of a month ago. They are deliverable now at above 4 cents. Mixed tires have become quite active. Mixed scrap and hose is also in steady movement but still at low prices, while mechanical scrap has not yet experienced appreciably the improvement noted in the higher grades of scrap stock.

The scrap dealers and reclaimers share alike the gratifying outlook for good business, which already has practically reached normal volume.

Quotations for Carload Lots Delivered

November 26, 1922

Prices subject to change without notice

Boots and Shoes			
Boots and shoes, black	*lb.*	$0.03¾ @	$0.04
Trimmed arctics	*lb.*	.02½ @	.03
Untrimmed articles	*lb.*	.02¼ @	.02½
Hard Rubber			
Battery jars, black compound	*lb.*	*.01 @	
glossy	*lb.*	.08 @	.10
Inner Tubes			
No. 1	*lb.*	.04½ @	.05
Compounded red	*lb.*	.03¾ @	.04
Mechanicals			
Black scrap, mixed	*lb.*	*.01½ @	
Heels	*lb.*	*.02½ @	.03
Horse-shoe pads	*lb.*	*.02½ @	.03
Hose, air brake	*lb.*	*.01 @	.01½
regular	*lb.*	*.01 @	
Red scrap, mixed	*lb.*	*.07 @	.08
White scrap, mixed	*lb.*	*.07 @	.07½
Tires			
Pneumatic			
Auto peelings	*lb*	.01¼ @	.01½
Bicycle	*lb.*	.01 @	.01¼
Standard white auto	*lb.*	*.02¼ @	.02¾
Mixed auto	*lb.*	.00¾ @	.01
Stripped, unguaranteed	*lb.*	*.01 @	.01½
Solid			
Carriage	*lb.*	.02¾ @	.03
Irony	*lb.*	@	
Truck, clean	*lb.*	.01¾ @	.02

*Nominal.

DUNLOP DOMINATES JAPANESE TIRE MARKET

According to *Commerce Reports*, The Dunlop Co., of Kobe, supplies about 85 per cent of the Japanese tire demand. This organization has advantages in regard to the supply of crude rubber, cheap labor, and the import duties levied on shipments from the United States. The Dunlop company also controls the best distributing system in Japan, the Japanese Automobile Co., Limited.

UNITED STATES AND GOODRICH ADVANCE TIRE PRICES

The United States Rubber Co. and The B. F. Goodrich Co. announced, on December 28, advances ranging from 10 to 12½ per cent in consumers' prices of pneumatic tires and tubes. The advance announced by the United States Rubber Co. takes effect January 2, 1923.

"PNEUMATIC TIRES," by Henry C. Pearson, contains three chapters of valuable information on pneumatic tire fabrics. First edition now ready for mailing.

The Market for Cotton and Other Fabrics

New York

AMERICAN COTTON. December 1, spot middlings were reported in poor demand at 25½ cents. From this figure the price fell within a week to 24½ from which level it rose steadily for the next three weeks with only two or three minor drops. On the 26th of the month the price was 26.80 cents and the market inactive and holders were not pressing for sales.

Ginning figures indicate a final crop outturn of 9,750,000 bales. At the present rate of consumption the supply will be sufficient to meet requirements until the next crop is available.

EGYPTIAN COTTON. According to the Egyptian customs figures, 149,300 bales were exported from Alexandria during November. This is the high record shipment for a single month. The figures of December shipment also promise to be very high. It is estimated that 3,000,000 cantars will be shipped from the beginning of the season until the end of this year. Accordingly only 2,000,000 cantars will remain for shipment during the other eight months of this season.

The demand for Sakellardis has eased a little, while an active demand for medium and lower uppers continues. Egyptian Uppers are being sold in small lots at between 30 and 31 cents. There is very little demand for Sakellaridis, medium grades of which can be bought about 4 or 5 cents higher.

ARIZONA COTTON. Arizona Pima cottons are selling slowly at about the price of Sakels and the lower grades are just beginning to appear on the market. Latest reports from Phoenix indicate that the crop may not reach 30,000 bales.

Cotton Fabrics

DRILLS, DUCKS AND OSNABURGS. After a quiet spell of three to four weeks in the cotton fabric market the tone is now better, inquiries are more active, and considerable business is being closed for deliveries through the spring months. Renewal of evident strength in the raw material market has aided in bringing about the more active trading on fabrics. It has served, as the advancing prices of cotton did, to again attract attention of consumers of cotton goods to the fact that higher prices for cloths are likely to obtain between now and the late spring months. Deliveries of merchandise are going to be much more important to the consumer in the next few months than the matter of price.

RAINCOAT FABRICS. Business in raincoat fabrics is rather quiet but much activity is expected after the first of the coming year.

SHEETINGS. The market in sheetings is rather quiet but firm with a marked tendency for advancement in prices.

TIRE FABRICS. The tire fabrics market is quiet with prices fairly firm in anticipation of renewed buying activity early next year. Cord fabric is in good demand and even square-woven tire fabric still holds its own in the buying.

New York Quotations

December 26, 1922

Prices subject to change without notice

Burlaps

40—7-ounce ..... 100 *yds.*		@
40—7½-ounce	$7.10	@ $7.30
36—8-ounce		@
40—8-ounce	7.20	@ 7.40
40—10-ounce	8.90	@
40—10½-ounce	9.05	@

Drills

38-inch 2.00-yard	.24	@
40-inch 3.47-yard	.14½	@
52-inch 1.90-yard	.26⅞	@
60-inch 1.52-yard	.34½	@

Duck

CARRIAGE CLOTH

38-inch 2.00-yard ..... *yard*	.25	@
40-inch 1.47-yard	.32¾	@
72-inch 16.66 ounce	.57⅛	@
72-inch 17.21-ounce	.59	@

MECHANICAL

Hose ..... *pound*	.49	@
Belting	.48	@

Osnaburgs

40-inch 2.35-yard ..... *yard*	.21⅜	@
40-inch 2.48-yard	.20½	@
37½-inch 2.42-yard	.20¾	@
40-inch 3.00-yard	.17	@

Tennis

51-inch 1.35-yard ..... *yard*	.38½	@

Hollands

DULL FINISH

Standard, 37-inch, white and colors ..... *yard*	.19½	@
42-inch, white and colors	.23½	@

FLAT FINISH

Imperial, 36-inch, white and colors	.15½	@
40-inch, white and colors	.17½	@

Raincoat Fabrics

COTTON

Bombazine 64 x 60 ..... *yard*	.14	@
60 x 48	.12¾	@
Cashmeres, cotton and wool, 36-inch, tan	.55	@
Plaids 60 x 48	.13	@
56 x 44	.12¾	@
Surface prints 60 x 48	.14	@
64 x 60	.15	@

Sheetings, 40-inch

48 x 48, 2.50-yard ..... *yard*	.18½	@	.19
48 x 48, 2.85-yard	.15¼	@	.15½
64 x 68, 3.15-yard	.15½	@	.15¾
56 x 60, 3.60-yard	.13½	@	.14
48 x 44, 3.75-yard	.12¼	@	.12½
44 x 44, 5.50-yard	.10	@	
44 x 44, 5.00-yard	.10¼	@	

Sheetings, 36-inch

48 x 48, 5.00-yard ..... *yard*	.09¾	@
40 x 40, 6.00-yard	.07⅞	@

Silks

Canton, 38-inch ..... *yard*	.35	@
Schappe, 36-inch	.47½	@

Tire Fabrics

BUILDING

17¼-ounce Sakellaridis, combed ..... *pound*	.79	@	
17¼-ounce Egyptian, combed	.72	@	.73
17¼-ounce Egyptian, carded	.67	@	.68
17¼-ounce Peeler, combed	.73	@	
17¼-ounce Peeler, carded	.55	@	.60

CORD

15-ounce Egyptian, combed ..... *pound*	.75	@	.76
15-ounce Egyptian, carded	.70	@	.71
2½-pick Peeler, carded	.63	@	.65

BICYCLE

8-ounce American ..... *pound*		@
10-ounce American		@

BREAKER

Leno, Peeler, carded	.60	@

CHAFER

9¼-ounce Egyptian, carded ..... *pound*	.75	@
9¼-ounce Peeler, carded	.68	@

THE COMMITTEE ON ELECTRICITY OF THE AMERICAN RAILWAY Engineering Association has adopted as standard practise the tentative specifications for rubber insulating tape proposed by the American Society for Testing Materials.

Rubber Trade Inquiries

The inquiries that follow have already been answered; nevertheless they are of interest not only in showing the needs of the trade, but because of the possibility that additional information may be furnished by those who read them. The Editor is therefore glad to have those interested communicate with him.

(120) Inquiry is made for the addresses of manufacturers of rubber dust caps.

(121) We have received a request for addresses of manufacturers of paper for making inner tube transfers.

(122) A reader desires addresses of concerns making a composition knob with nickeled brass insert, such as used on typewriter paper-feed rollers.

(123) A manufacturer desires addresses of concerns making solid tires for electric industrial trucks.

(124) Inquiry is made for addresses of manufacturers of sanitary specialties and rubberized kitchen or household aprons.

(125) A druggists' supply house requests addresses of manufacturers of crutch tips reinforced with metal inserts.

(126) Concern contemplating manufacture of hard rubber battery jars desires addresses of manufacturers of suitable molding machinery.

(127) A dealer asks for addresses of concerns manufacturing sponge rubber arch supporters.

(128) Request is made for the address of the manufacturer of or dealer in "Du Rein" raincoats.

(129) British manufacturer of a rubber device for wringing desires American connection for marketing in this country.

(130) A reader desires to know where in New York City he can take a course in rubber chemistry, particularly compounding and milling.

(131) Request is made for addresses of manufacturers of inner tube cross-wrapping machines with adjustable speed and tension.

Foreign Trade Opportunities

Addresses and information concerning the inquiries listed below will be supplied to our readers through the Foreign Trade Bureau of The India Rubber World, 25 West 45th street, New York, N. Y. Requests for each address should be on a separate sheet and state number.

(4352) Spare tires—India. Purchase and agency. Quote f. o. b. New York.

(4365) Rubber tires—Chile. Purchase. Quote in Spanish c. i. f. Chilean port. Cash against documents.

(4371) Electrical goods, rubber belting and hose, etc.—Sweden. Agency. Quote f. o. b. New York.

(4375) Machines for shoemaking and shoe findings, especially rubber soles and heels—Sweden. Agency and purchase. Payment on receipt of goods through forwarding agent.

(4418) Rubber sponges, fountain pens, etc.—Hungary. Quote c. i. f. Budapest.

(4425) Tires and tubes—France. Agency. Quote in French c. i. f. Bordeaux.

(4427) Wire cables, asbestos and rubber goods, sanitary supplies, belting, packing, etc.—Cuba. Sole agency. Send samples and catalogs.

(4434) White shoes with rubber soles, with seams—Norway. Agency.

(4439) Electrical lamp cord, insulators, wet and dry batteries, etc.—Peru. To represent manufacturers.

(4452) Tennis, golf, football, and swimming supplies—Argentina. Purchase. Quote in Spanish c. i. f. Argentine port.

(4467) Heavy rubber footwear for peat bogs—Italy. Purchase. Quote c. i. f. Italian port.

(4479) Rubber overshoes—Norway. Agency.

(4502) Tires and tubes—Tunisia. Agency. Quote in French or Italian c. i. f. Tunis.

(4505) Fountain pens and office supplies—Hungary. Agency. Quote in German or Hungarian c. i. f. Budapest.

(4506) Machinery belting, pumps, etc.—Palestine. Agency.

(4510) Engineering equipment, driving belts, etc.—Switzerland. Purchase and agency.

(4514) Rubber overshoes—Syria. Purchase. Quote in French c. i. f. Syrian port. Cash against documents.

(4515) Rubber shoes, 1,000 pairs, for tennis and boating, highest grade—Switzerland. Purchase.

(4517) Rubber water bottles, ice packs, fountain syringes, etc. —Spain. Purchase. Quote c. i. f. Spanish port.

(4518) Mottled rubber balloons and rubber novelties—Scotland. Purchase. Quote c. i. f. Glasgow. Cash against documents.

(4540) Erasers and stationery novelties—Australia. Purchase. Quote f. o. b. American port. Cash against documents.

(4543) Auto accessories, tires, air pumps, vulcanizing outfit, etc.—Hungary. Agency. Quote c. i. f. Hamburg.

(4547) Bicycle tires and tubes, standard grades—Hungary. Purchase. Quote in German or Hungarian c. i. f. Hamburg. Cash against documents in New York.

(4568) Auto tires and vulcanizing and retreading outfit specialties—Hungary. Agency. Quote in French, German, or Hungarian c. i. f. Hamburg.

(4575) Brake linings—Norway. Agency from manufacturers.

(4582) Various grades rubber hose—Manchuria. Purchase by representative of American firm in Manchuria.

(4585) Tires—England. Agency or purchase. Cash. Quote f. o. b. port of shipment.

(4606) Tires—Germany. Agency. Quote c. i. f. German port.

(4620) Tires—Venezuela. Agency.

(4625) Inner soles and linings for making arctic overshoes—Finland. To represent manufacturers. Quote c. i. f. Finnish port.

(4629) Rubber bathing caps and sleeve protectors, corsets, etc. —Switzerland. Agency. Quote c. i. f. Antwerp or Marseilles.

(4634) Irrigational plant equipment, hose, sprays, etc., for truck gardeners and hothouses—Austria. Purchase and agency. Quote f. o. b. New York.

(4637) Rubber packing and rubber for electrical purposes—Poland. Agency. Quote c. i. f. Danzig.

(4642) Tires—Poland. Agency. Quote c. i. f. Danzig. Payment, United States currency.

(4646) Cotton fabric rubber-lined fire hose, 500 feet in 50-foot lengths, 2½-inch, and connections, 6 threads per inch—Canada. Purchase. Cash. Quote f. o. b. Canadian port.

(4665) Carbon black in quantity, 5 or 10 tons initial order—Belgium. Purchase and agency. Cash against documents. Quote c. i. f. Antwerp.

(4668) Fiber, cork, and gum insoles for shoes—Norway. Agency.

Trade Lists Available

Mimeographed copies of the following lists may be had by referring to titles and file numbers:

Rubber goods, importers and dealers, Dutch Guiana, LA-17003.

Rubber goods, importers and dealers, British Honduras, LA-26002.

Rubber goods, importers and dealers, Portugal, EUR-10010-A.

TIRE MARKET IN BRITISH SOUTH AFRICA

While there are 1,500 motor trucks and power lorries in British South Africa, a large percentage of this total is made up of vehicles requiring pneumatics rather than solid tires, Trade Commissioner Stephenson reports. The trend is toward the increase in the use of inch straightside equipment on passenger cars. About 25 per cent of the 29,000 cars now use such equipment, while only about 30 per cent use metric clinchers; inch clinchers are used by about 45 per cent.

The Market for Chemicals and Compounding Ingredients

New York

IN most of the items of compounding ingredients, business during the past month has been of a stable and seasonable character with no important advances in price.

In all lines also the outlook is considered good as to business following the first of the new year, markedly so in the case of materials essential for tire and mechanical rubber goods lines. Inadequate facilities for freight movement, especially in the South and Southwest, still persist although some improvement has been noted the past month.

ANILINE. Requests for material have been very active with prices firm and steady and but little spot stock available.

BARYTES. There has been some advance in price on washed barytes but none on off-color grades. Poor rail service still hampers deliveries.

BLANC FIXE. The situation is much the same as in the case of barytes, except there has been no change in prices.

CARBON BLACK. There is no lack of stocks at production points but absence of adequate rail service seriously hampers meeting the needs of consumers. This condition, however, is slowly improving. Prices are steady. The outlook for next year is exceptionally good, especially in anticipation of liberal requirements from the tire trade.

CHINA CLAY. China clay has become well established both as filler and toughener in mechanicals, tires and heels especially, resulting in a steady and heavy demand. In tires and heels it competes with other important wear-resistant materials. As with carbon black poor shipping facilities in the South have been a serious drawback for months in its distribution.

DRY COLORS. Prices hold steady and business may be considered good.

LITHARGE. There is a steady seasonal call for litharge with a tendency toward increased business in the rubber trade. Prices continue unmodified.

SOLVENT NAPHTHA. The supply is reported short; consequently the price remains strong although business is rather light in volume.

SUBLIMED LEAD. The same conditions prevail with sublimed lead as with litharge and other lead products. Activity is not marked but the future is promising.

SULPHUR. For months business has been typically steady and routine without price changes in rubber maker's or other grades.

TALC. Both domestic and imported grades are in active request at stable prices.

WHITING. The consumption of whiting, like that of a few other standard ingredients of universal use in rubber manufacturing lines, may be taken as barometric. At present the indication seems to be that rubber goods production in the major lines is practically at capacity.

ZINC OXIDE. For a whole year there has been no advance in price. Tire makers have been very large users of zinc oxide the past year and the outlook is that they will require still larger tonnage in 1923.

New York Quotations

December 26, 1922

Prices subject to new tariff revision

Accelerators, Organic

Accelerene (f. o. b. English port)	lb.	13s.	@
Accelemal	lb.	$0.35	@
Aldehyde ammonia crystals	lb.	.93	@
Aniline (f. o. b.) factory	lb.	.16	@ .20
Diphenyl guanidine	lb.	1.15	@ 1.35
Ethylidene aniline	lb.	.80	@ .90
Excellerex	lb.	.35	@ .45
Formaldehyde aniline	lb.	.51½	@
H. R.	lb.	1.40	@ 1.50
Hexamethylene tetramine	lb.	.95	@ .97½
Lead oleate (bbls.)	lb.	.16	@
Methylene aniline	lb.	.38	@ .42
Methylene paratoluidine	lb.	1.35	@
N. C. C.	lb.		@
No. 500 Rubber	lb.	.37	@ .40
No. 801 Rubber	lb.	.75	@ .85
No. 999	lb.	.14½	@
Paradin	lb.	.37	@
Paraphenylene diamine	lb.	1.50	@ 1.55
Super-sulphur, No. 1	lb.	.50	@ .60
No. 2	lb.	.25	@ .30
Super-X	lb.	.50	@
Super-XX	lb.	.80	@
Tetramethyl thiuram disulphide	lb.	6.00	@
Thiocarbanilide	lb.	.27	@ .33
Vul-Ko-Cene	lb.	.35	@
XLO	lb.		@

Accelerators, Inorganic

Lead, sublimed blue	lb.	.08	@
sublimed white	lb.	.08	@
Lime, flour, superfine	lb.	.02	@ .02½
Litharge, domestic	lb.	.08½	@ .10¾
imported	lb.	*.17	@
Magnesia, carbonate, light	lb.	.08	@ .09
calcined, light (bbls.)	lb.	.24	@
calcined, ex. light (bbls.)	lb.	.45	@
calcined, md. light (bbls.)	lb.	.15	@
calcined, heavy (bbls.)	lb.	.05	@
oxide	lb.	.05	@ .05¾

Acids

Acetic 28% (bbls.)	cwt.	3.17½	@ 3.92½
glacial, 99%	cwt.	12.05	@12.85
Cresylic (97% straw color)	gal.	.60	@ .62
(95 dark)	gal.	.55	@ .57
Sulphuric, 66 degrees	ton	14.00	@16.00

Alkalies

Caustic soda	cwt.	3.60	@ 3.75

*Nominal.

Colors

BLACK

Bone, powdered	lb.	$0.05½	@$0.07½
Carbon black	lb.	.18	@ .24
pressed	lb.	.19	@ .25
Dipped goods	lb.		@
Drop	lb.	.07½	@ .16
Gritless black	lb.	.40	@
Hyposulphite of lead	lb.		@
Iron oxide	lb.	.04½	@ .16
Ivory black	lb.	.15	@ .45
Lampblack	lb.	.12	@ .40
Micronex	lb.		@

BLUE

Cobalt	lb.	.21	@ .26
Dipped goods	lb.		@
Gritless blue	lb.	3.50	@
Prussian	lb.	.55	@ .60
Ultramarine	lb.	.10	@ .35

BROWN

Iron oxide	lb.	.05	@ .06
Sienna, Italian	lb.	.05½	@ .07½
Umber, Turkey	lb.	.05½	@ .06½
Vandyke	lb.	.04½	@ .05

GREEN

Chrome, light	lb.	.30	@ .32
medium	lb.	.35	@ .36
dark	lb.	.36	@ .45
commercial	lb.	.12	@
tile	lb.	.11	@ .13
Dipped goods	lb.		@
Gritless green	lb.	3.50	@
Guignet	lb.	1.00	@
Oxide of chromium	lb.	.55	@

RED

Antimony, crimson	lb.	$0.39½	@
crimson, 15/17% free	lb.		@
crimson, R.M.P. No. 3	lb.	.50	@
crimson F.	lb.	.35	@
Antimony, golden	lb.	.18½	@$0.24
golden R.M.P. No. 7	lb.	.21	@
golden, 15/17% free	lb.		@
golden, No. 1	lb.	.30	@
golden, No. 2	lb.	.25	@
7-A	lb.	.35	@
vermilion 15/17% F. S.	lb.	.55	@
vermilion 5% F. S.	lb.	.65	@
red sulphuret, 15/17%	lb.		@
Arsenic sulphide, red	lb	.13½	@ .14½
lemon	lb.		@
orange	lb.		@
Cadmium sulphide, red	lb.	1.85	@
Dipped goods red	lb.		@
purple	lb.		@
orange	lb.		@
Gritless red (four shades)	lb.	3.50	@
purple	lb.	2.50	@
Indian	lb.	.08	@ .12
Indian maroon, English	lb.	.13	@
Iron oxide, reduced	lb.	.12	@
pure bright	lb.	.14	@
Maroon oxide	lb.	.08	@ .12
Red oxide, crimson	lb.	.06	@
English	lb.	.13	@
Spanish	lb.	.03	@ .04½
Oximony	lb.	.16	@
Para toner	lb.		@
Spanish natural	lb	.03½	@ .04½
Toluidine toner	lb.	2.10	@ 2.25
Venetian	lb.	.03½	@ .06
Vermilion, American	lb.	.25	@ .30
English quicksilver	lb.	1.35	@ 1.45

WHITE

Albalith	lb.	.06	@ .06½
Aluminum bronze	lb.	.55	@ .60
Lithopone, domestic	lb.	.06	@ .06½
Zinc oxide:			
American Horse Head Special	lb.	.08	@ .08½
XX red	lb.	.07½	@ .08

Colors—*Continued*

WHITE—*Continued*

French process, Florence			
Green seal	lb.	$0.09½ @	$0.10¼
Red Seal	lb.	.08¼ @	.09¼
White seal	lb.	.11 @	.11¼
Azo (factory):			
ZZZ (lead free)	lb.	@	
ZZ (—5% leaded)	lb.	@	
Z (8.10% leaded)	lb.	@	
Zinc sulphide	lb.	.45 @	

YELLOW

Arsenic, yellow	lb.	.87½ @	
Cadmium, sulphide, light	lb.	1.50 @	1.85
Chrome, light and med.	lb.	.17 @	
Dipped goods	lb.	@	
Gritless yellow	lb.	3.50 @	
India rubber	lb.	@	
Ochre, domestic	lb.	.03 @	.03¼
imported	lb.	.03¼ @	.04

Compounding Ingredients

Aluminum flake (carloads)	ton	15.00 @	29.00
hydrate, light	lb.	.16 @	.18
Ammonia carbonate	lb.	.10¼ @	.12¾
Asbestine	ton	15.00 @	25.00
Aluminum silicate	ton	22.00 @	25.00
Barium, carbonate, precip.	ton	71.00 @	76.00
dust	ton	100.00 @	
Barytes, pure white C. L.	ton	23.90 @	
off color (carloads)	ton	20.00 @	
uniform floated (carloads)	ton	23.90 @	
Basofor	lb.	.04¼ @	
Blanc fixe	lb.	.04½ @	.04½
Carrara filler (factory)	lb.	.02 @	
Chalk, precip. extra light	lb.	.03½ @	.04¼
heavy (f.o.b. factory)	lb.	.02½ @	.03¼
China clay, Dixie	ton	22.00 @	32.00
Blue ribbon (carloads)	ton	14.00 @	
Blue Ridge	ton	20.00 @	30.00
Cotton flock, black	lb.	.12 @	.13
light-colored	lb.	.12 @	.13
white	lb.	.15 @	.22
Cotton linters clean mill-run	lb.	.06 @	
Fossil flour (powdered)	ton	60.00 @	
(bolted)	ton	60.00 @	
Glue, high grade	lb.	.30 @	.40
medium	lb.	.20 @	.26
low grade	lb.	.16 @	.19
Graphite, flake	lb.	.05 @	
amorphous	lb.	.05 @	
Infusorial earth (powd.)	ton	60.00 @	
(bolted)	ton	65.00 @	
Mica, powdered	lb.	.15 @	
Pumice stone, powdered	lb.	.03 @	.05
Rotten st., powd. (bbls.)	lb.	.02½ @	.04½
Silica, gold bond (factory)	ton	31.00 @	
silver bond (factory)	ton	25.00 @	
Soap bark, cut	lb.	.07½ @	.09
Soapstone, powdered, gray	ton	12.00 @	
Sodium bicarbonate (bbls.)	lb.	.02½ @	
Starch, powd. corn (bags)	cwt.	2.82 @	2.92
(bbls.)	cwt.	3.10 @	3.20
Talc, soapstone	ton	12.00 @	22.00
Terra blanche	ton	22.00 @	25.00
Tripoli flour, cream or rose	ton	@	
white (factory)	ton	@	

Chemical Market—*Continued*

New York Quotations

December 26, 1922

Prices subject to new tariff revision

Tyre-lith	ton	$80.00 @	$85.00
Whiting, Alba	cwt.	@	
chalk	ton	@	
commercial	cwt.	1.00 @	1.10
Danish (factory)	ton	14.00 @	
English cliffstone	cwt.	1.60 @	1.75
gilders (bolted)	cwt.	1.10 @	
K. T.	ton	16.00 @	
Paris, white, American	cwt.	1.25 @	1.35
Perfection	ton	22.00 @	25.00
Plymouth	ton	@	
Quaker	ton	13.00 @	15.00
Superfine	ton	@	
Wood pulp, XXX	ton	35.00 @	
X (f.o.b. factory)	ton	25 00 @	

Mineral Rubber

Gilsonite	ton	65.00 @	
Genasco (factory)	ton	60.00 @	62.00
Hard hydrocarbon	ton	33.00 @	42.00
Liquid rubber	lb.	.15 @	
Soft hydrocarbon	ton	32.50 @	38.00
320/340 M. P. hydrocarbon	ton	@	
300/310 M. P. hydrocarbon	ton	@	
Pioneer, M. R., solid (fac.)	ton	@	
M. R. granular	ton	@	
Robertson, M. R., solid	ton	35.00 @	75.00
M. R. granular (factory)	ton	54.50 @	72.50
Rubrax (factory)	ton	60.00 @	
States "A"	ton	@	
No. 1	ton	@	
Synpro, gran. M. R. (fac.)	ton	55.00 @	75.00

Oils

Avoilas compound	lb.	.14 @	
Castor, No. 1, U. S. P.	lb.	.12½ @	
No. 3, U. S. P.	lb.	.12 @	
Corn	lb.	.10¼ @	
Cotton	lb.	.11½ @	
Glycerine	lb.	.18½ @	.19
Halowax (500-lb. drums)	lb.	.25 @	.27
Linseed, raw	lb.	.11¾ @	.12
Palm lagos	lb.	.07¼ @	.07½
Palm, niger	lb.	.08¼ @	
Peanut	lb.	.13 @	
Petrolatum, standard	lb.	.05 @	.08
Petrolatum, sticky	lb.	.08 @	.10
Pine, steam distilled	gal.	.78 @	.85
Rapeseed, refined	gal.	.83 @	
blown	gal.	.93 @	
Rosin	gal.	.42 @	.50
Synpro	gal.	.40 @	.80
Soya bean	lb.	.10½ @	
Tar	gal.	.26 @	.28

Resins and Pitches

Cumar resin hard	lb.	@	
soft	lb.	@	
Tar, pine, retort	bbl.	$10.00 @	$12.00
kiln	bbl.	11.50 @	13.00
Pitch, Burgendy	lb.	.05 @	
coal tar	lb.	.01½ @	
hardwood	lb.	.02 @	.03
pine tar	lb.	.03 @	
ponto	lb.	.06½ @	
Rosin, K (bbl.)	280 lbs.	6.75 @	
strained (bbls.)	280 lbs.	6.75 @	
Shellac, fine orange	lb.	.90 @	

Solvents

Acetone (98.99% drums [6.62 lbs. per gal.])	lb.	@	
Benzol (90%, drums [7.21 lbs. per gal.])	gal.	.42 @	
pure (drums)	gal.	@	
Carbon bisulphide (dms. [10.81 lbs. per gal.])	lb.	.06½ @	.07½
tetrachloride (drums, [13.28 lbs. per gal.])	lb.	.09½ @	.10½
Motor gasoline (steel bbls.)	gal.	@	
Naphtha, V. M. & P.	gal.	@	
solvent (drums extra)	gal.	.23 @	
Cymene (factory)	lb.	.15 @	
Toluol, pure (7.21 lbs. per gal.)	gal.	@	
Turpentine, spirits	gal.	1.39 @	
wood, steam distilled	gal.	1.30 @	

Substitutes

Black	lb.	.08 @	.13
Brown	lb.	.09 @	.15
White	lb.	.09 @	.16
Brown factice	lb.	.09 @	.15
White factice	lb.	.08½ @	.14½

Vulcanizing Ingredients

Black hypo	lb.	.25 @	.50
Sulphur chloride (drums)	lb.	.08 @	
(jugs)	lb.	.13½ @	
Sulphur, Bergenport brand, 100% pure (bbls.)	cwt.	2.55 @	2.90
(bags)	cwt.	2.30 @	2.65
Sulphur flour (bbls.)	cwt.	@	
(bags)	cwt.	@	
Superfine 100% pure	cwt.	@	

(See also Colors—Antimony)

Waxes

Wax, beeswax, white, com.	lb.	.45 @	
ceresine, white	lb.	.12 @	
carnauba	lb.	.20 @	
montan	lb.	.03½ @	.04
ozokerite, black	lb.	.18 @	
green	lb.	.26 @	.28
paraffine	lb.	.02¼ @	.04⅜
sweet wax	lb.	.10 @	.12

*Nominal.

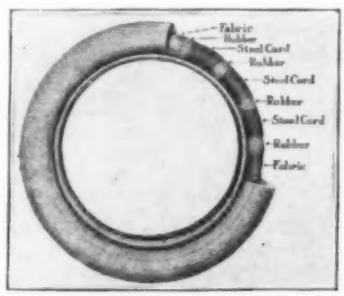
BALATA GATHERED AT A LOSS

Instead of making a profit the balata gatherer of Venezuela works for less than nothing, according to a statement issued by the Department of Commerce. The exploitation of balata (the dried juice or gum of the bullet-tree or bully-tree) began in 1896 when the article was exported in small quantities from the state of Monagas where the trees grew in great numbers. From that time to the end of 1921 there were exported from Ciudad Bolivar 29,873,433 kilos of balata, the production in 1921 being 805,645 kilos, valued at bolivars 4,592,145.

The present crisis in the industry is due to the low price of balata at Ciudad Bolivar; also to the fact that in some instances the classification is too strict. The price has no relation to the cost of exploitation in the interior and one must add heavy expenses for freight and duties. The actual cost of first-class balata or "flower" balata is bolivars 160 the 46 kilograms. A good workman produces only fifteen quintals a year, which means that this workman by physical labor during the crop and taking out 15 quintals, earns the total sum of bolivars 414 (about $81); and on the other hand to produce the 15 quintals referred to, he has expended to effect this exploitation the sum of bolivars 750, so that he loses by his work the sum of bolivars 336.50.

STEEL CORD TIRE

The illustration shows a part sectional side view exhibiting the construction of a Lomer steel cord tire. The tire is designed for use on heavy duty trucks where there is a great demand for pneumatic tires of exceptional strength. The construction shown consists of alternate plies of fabric and cabled wire of special alloy steel proof against crystallization, chemical action, or rust. Three plies of wire cord alternate with plies of rubber and diagonally-laid fabric. Each wire ply lies at right angles to the next wire ply. The construction possesses great strength and resistance to puncturing and is said to be proof against blowouts.—Lomer Armored Tire Co., New Castle, Indiana.



Lomer Steel Cord

Tire Production and Crude Rubber Consumption

Statistical Review, 1921 and 1922—Outlook for 1923

THE chart here used consists of ratio ruling in four cycles scaling vertically from 10,000 to 10,000,000, indicating, in the case of tires and tubes, the number produced, and in the case of crude rubber, pounds consumed.

The figures used in plotting the curves are given in the Tables I and II. Those for production of the casings, inner tubes, and solid tires were obtained from the published figures of The Rubber Association of America, by suitably increasing the reported amounts which are estimated to be 80 per cent of the actual production.

To obtain the respective amounts of crude rubber consumed in the manufacture of casings, tubes and solids, and the totals for all tire products and all rubber products, indicating the entire industry in America, the following factors were assumed.

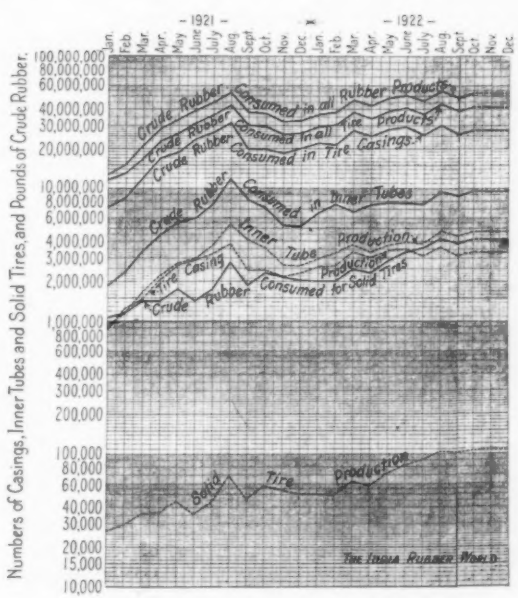
Average weight of crude rubber required per casing, 8¼ pounds; per inner tube, 2 pounds; per solid tire, 40 pounds. The rubber tire industry is believed to consume 80 per cent of the crude rubber imported for the entire rubber manufacturing industry; therefore, the total amount of rubber used for tire products increased by one-quarter gives the totals, and in plotting the curve the crude rubber consumed in all rubber products and the production figures for November and December, 1922, are the only ones estimated.

Points of special interest shown by the curves, which are strictly comparable due to the ratio ruling, are that the peak of rubber manufacturing occurs in August of each year. The output for 1922 has been better sustained than in 1921, shown by slight decline from the August figures for the remainder of the year.

In 1921 the tonnage of rubber used in tire casings, inner tubes, and solid tires was 134,712 and for all rubber products made that year, 175,200 tons. In 1922, the corresponding tonnages of rubber used were 205,512 and 280,584, respectively.

The revival of general industrial activity of the past two years approaching normal in many lines is now approximating capacity output in tires and tubes, and all other rubber goods lines as well.

The automobile industry has had a record year of production and the outlook for 1923 is considered more favorable still. This will sustain the tire industry at the present production level which is at the rate of 41,300,000 yearly. Some authorities set the probable tire output for 1923 as high as 50,000,000 tires.



Ratio Graph of Tire Production

Table I

TIRE CASINGS, INNER TUBES, AND SOLID TIRES PRODUCED—1921 AND 1922

1921	Tire Casings Number	Inner Tubes Number	Solid Tires Number
January	879,000	926,000	26,500
February	1,025,000	1,171,000	29,500
March	1,454,000	1,684,000	35,900
April	2,066,000	2,202,000	36,000
May	2,626,000	2,762,000	44,000
June	2,893,000	2,950,000	35,500
July	3,212,000	3,775,000	43,390
August	3,814,000	5,538,000	69,400
September	2,411,000	4,094,000	46,700
October	2,410,000	3,555,000	57,900
November	2,198,000	2,657,000	54,400
December	2,300,000	2,588,000	50,600
Totals	27,288,000	33,902,000	529,790
1922			
January	2,569,000	2,930,000	50,020
February	2,605,000	3,247,000	49,400
March	3,307,000	3,773,000	61,700
April	3,001,000	3,314,000	58,200
May	3,402,000	3,739,000	72,000
June	3,547,000	3,912,000	82,600
July	3,095,000	3,835,000	89,500
August	3,631,000	4,760,000	105,400
September	3,130,000	4,379,000	103,500
October	3,344,000	4,735,000	106,900
November	3,444,000*	4,735,000*	106,900*
December	3,444,000*	4,735,000*	106,900*
Totals	37,519,000	48,094,000	993,020

* Estimated.

Table II

CRUDE RUBBER CONSUMED IN TIRES AND TUBES AND OTHER RUBBER MANUFACTURES—1921 AND 1922

1921	Tire Casings Pounds	Inner Tubes Pounds	Solid Tires Pounds	All Tire Products Pounds	All Rubber Products Pounds
January	7,251,750	1,852,000	1,060,000	10,163,750	12,704,690
February	8,456,250	2,342,000	1,180,000	11,978,250	14,972,812
March	11,995,500	3,368,000	1,436,000	16,799,500	20,999,375
April	17,044,500	4,404,000	1,440,000	22,888,500	28,610,625
May	18,664,500	5,524,000	1,760,000	25,948,500	32,435,625
June	23,867,250	5,900,000	1,420,000	31,187,250	38,984,062
July	26,499,000	7,550,000	1,756,000	35,805,000	44,756,250
August	31,465,500	11,076,000	2,776,000	42,541,500	53,176,875
September	19,890,750	8,188,000	1,868,000	29,946,750	37,434,687
October	19,882,500	7,110,000	2,316,000	29,308,500	36,885,625
November	18,133,500	5,314,000	2,176,000	25,623,500	32,029,375
December	18,975,000	5,176,000	2,024,000	26,175,000	32,718,750
Total	234,427,000	67,804,000	21,152,000	308,366,000	385,708,751
1922					
January	21,194,250	5,860,000	2,008,000	29,062,250	36,577,812
February	21,491,250	6,494,000	1,976,000	29,961,250	37,701,562
March	27,342,750	7,546,000	2,468,000	37,356,750	46,695,937
April	24,758,825	6,628,000	2,328,000	33,714,825	42,143,531
May	28,066,500	7,478,000	2,880,000	38,424,500	48,030,625
June	29,262,750	7,824,000	3,304,000	40,390,750	50,488,438
July	25,533,750	7,670,000	3,580,000	36,783,750	45,979,688
August	29,965,750	9,520,000	4,216,000	43,695,750	54,619,688
September	25,822,500	8,758,000	4,140,000	38,720,500	48,400,500
October	27,587,000	9,470,000	4,276,000	41,333,000	51,666,333
November	27,587,000*	9,470,000*	4,276,000*	41,333,000*	51,666,333*
December	27,587,000*	9,470,000*	4,276,000*	41,333,000*	51,666,333*
Totals	316,199,325	96,188,000	41,736,000	452,109,325	617,303,113

* Estimated.

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